

THE IRON AGE

New York, Thursday, May 17, 1906.

A Heavy Duty Gas Engine Installation

In the Carnegie Technical Schools' Plant, Pittsburgh, Pa.

About the first of the year the new service plant of the Carnegie Technical Schools, Pittsburgh, Pa., was put into operation for supplying light and power to the buildings. Upon the opening of the schools a small gas engine unit was operated until the large horizontal double acting unit, forming the subject of this article, was installed. This small unit is now used for periods of light load on the plant. Current is distributed on a three-wire direct current system and lights and motors are fed from the same bus, the Westinghouse system of balancing assisting the regulation of the two sides of the system. A large number of the motors, varying from

the four-stroke cycle, with practically constant quality of mixture. With the tandem cylinder arrangement one power impulse is obtained on each forward and backward stroke, the resulting crank effort being equivalent to that of a single cylinder, double acting steam engine. Normally of 500 horse-power capacity the engine provides for a continuous overload capacity of 10 per cent., which is the standard practice of the builders in engines of this type. The cylinders are 21 inches in diameter by 30 inches stroke and the engine runs at a normal speed of 150 revolutions per minute.

For the sake of accessibility all parts of the engine

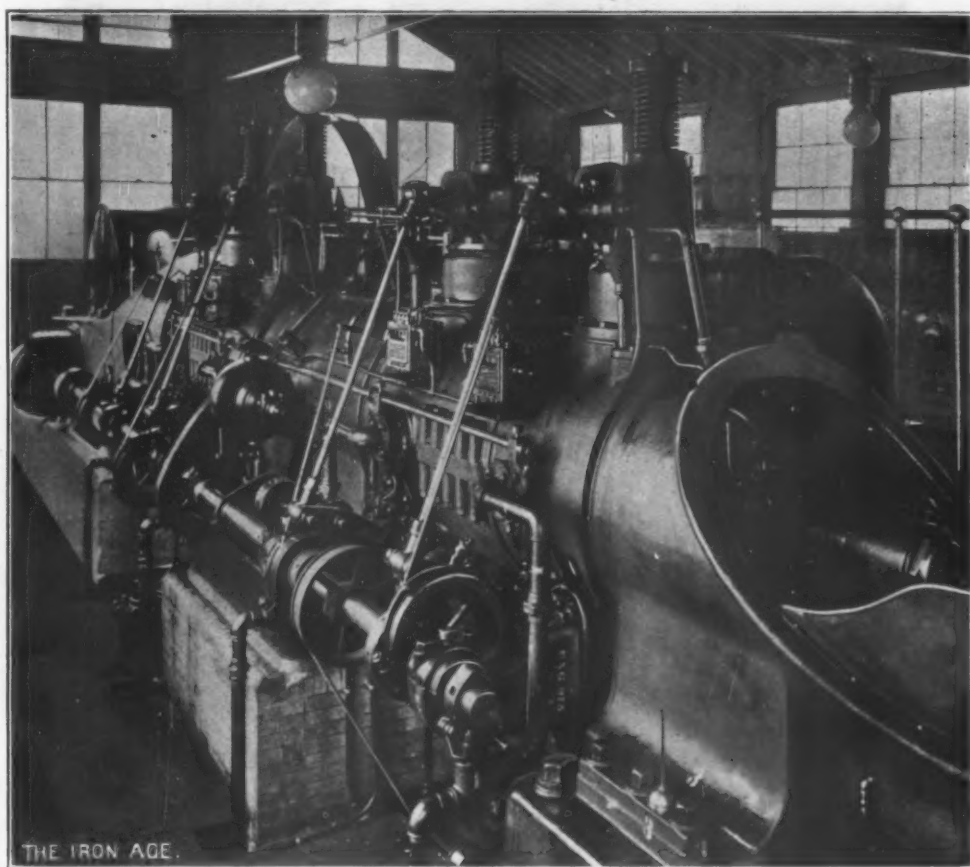


Fig. 1.—General View of the 500 Horse-Power Gas Engine Installed in the Carnegie Technical Schools by the Westinghouse Machine Company.

2 to 20 horse-power in capacity, are operating various classes of machinery in the several buildings, shops and laboratory, and the entire property depends upon this power plant for its light, power and heat. Its successful operation is evident from the fact that an emergency connection to an outside source of power originally provided for has never been put in.

The new gas engine unit is probably the most interesting part of the plant and is shown in the illustrations. Owing to the difficulty of obtaining a photograph of the entire engine the three half-tones, Figs. 1, 2 and 3, have been supplemented by the line elevation and plan given in Fig. 4. One feature characterizing the general design of this engine is its strong adherence to approved steam engine practice. The frame and cylinder structure resembles that of a horizontal tandem Corliss engine, and many of the features of the latter have been found equally applicable to the gas engine. The engine operates on

have been placed above the floor level, in comparison with the benefits of which the increased cost in foundations is immaterial. Unfortunately this makes the engine look much larger in comparison to the generator it drives than it really is, due somewhat also to the high generator speed.

It will be observed from the accompanying engravings that the cylinders are supported clear from the foundation by main, center and rear frames. Only the main frame is anchored; the others rest upon sliding ways to accommodate expansion and contraction of the engine body. To insure permanence of alignment the cylinder ends are recessed into their respective frames. The foundation body terminates at the floor level, separate piers rising 26 inches above the floor. This construction brings the exhaust valves and every working part of the engine above the floor.

Side crank construction was adopted in this engine. A

heavy box girder bed, cast in one piece, provides a rigid supporting structure for the main bearing and a continuous rectangular member surrounds the crank pit. The rigidity of the center crank construction is thus retained. To give access to the center cross head, the middle housing has its upper front quadrant cut away, the opening being closed by a heavy tie rod. All guides are bored. The crank shaft is solid forged steel, approximately 18 inches in maximum diameter, with a cast steel disk pressed on with a taper fit. On account of the large diameter of the shaft the crank pin is cast integral with the disk, special precautions being taken to insure homogeneous metal by casting under pressure head.

The bearings are of segmental construction. The main bearing is in three parts, the lower shell resting in a bored seat. The shell may be readily removed from above by jacking up the shaft. The bearings are cored for water cooling if found necessary and are faced with hammered babbitt. The connecting rod is forged steel,

move the cylinder head to accomplish this satisfactorily. The heads are in one piece, and are cored with water passages independent of glands. Their removal is easily accomplished by a special clamp bolted to the outer face, and so shaped that the center of gravity of the head falls directly under the eye bolts of the clamp, thus avoiding any binding on the rod as the head is removed. Important features in the design of the piston are a symmetrical piston structure without internal ribs, and permanent mounting on the piston rod. In the case of the pistons it was advisable to depart from the steam engine practice of using a ribbed box piston and to employ a structure which would be free to expand unrestrained by ribs or webs of any description. This result has been accomplished by a peculiar arrangement of internal parts performing the functions both of closing piece and water duct. The pistons were cast in one piece, and when their internal parts were assembled they were forced on the rods with hydraulic pressure. In addition they were



Fig. 2.—General View of the Engine from the Exhaust Side.

with solid ends at both the cross head and crank ends. Split bronze boxes are used with wedge adjustment. The cross head is cast steel with a single babbitted slipper locking over the ends of the cross head. This avoids reversible stresses or shear in wedge bolts. The slipper is turned cylindrical inside and out, so that it may be rolled out after easing off the weight. The cross head pin is of forged steel with continuous taper, and is removable through an opening in the housing with the assistance of a special starting clamp.

The cylinders are of symmetrical construction, only partly inclosed by jacket walls, a split jacket band closing the opening. This construction permits ready adjustment of strains due to shrinkage and differential expansion between cylinder and jacket walls, and also gives access for cleaning the jackets. A distinctive feature of the cylinder design is the vertical location of the valve chambers at each end of the cylinder structure for access to the interior. Advantages of this arrangement, especially for dirty gas, are obvious, as by removing a valve at each end of the cylinder, the interior is readily accessible for cleaning through the spacious openings. With any other construction it would be necessary to entirely re-

secured by a recessed nut, which was afterward turned off in a lathe flush with the piston surface. This construction is intentionally permanent, and in assembling or dismantling the engine the piston and rod are handled in one piece.

The piston rods are forged nickel steel, made in two pieces with water duct drilled through the center. They are screwed into the main, center and rear cross heads and are secured by keys. The center cross head is in the form of a split screw coupling resting upon and dowelled into the cross head support which is cast as a separate piece and is removable sidewise. This coupling thus acts as a closing piece to the piston structure, and enables repairs to be made upon one section of the engine without disturbing the other, during which time the remaining cylinder may be kept in service if necessary. The water duct of each rod section is closed at the ends by plugs, and a deflecting plug is inserted in the center line of each piston for the purpose of diverting incoming water into the piston channels.

Much importance is attached to "floating" the pistons clear of the cylinder walls through adjustments provided at the various cross heads. The rods have been so pro-

portioned that requisite stiffness is provided to carry the weight of the piston without flexure, thus the piston rings alone are in contact with the cylinder, resulting in small friction and wear, even with dirty gas. Each piston has four segmental cast iron rings set out with flat springs. By using segmental metallic packing rings arranged in series along the rod, the difficult problem of providing tight packing without undue friction has been solved. An important property of this packing is that it floats, thus easily absorbing slight variations in alignment due to flexure of the rod. The rings are mounted in a separate ring cage, independent of the head, and removable in one piece.

The poppet or mushroom type is used for both exhaust and inlet valves. They are all steel, seating in the direction of pressure by springs and mounted in one piece bonnets that are removable vertically from the cylinder casting without dismantling any of the lay shaft gear. The inlet valve performs the functions of both admission and governor valve, but the gas and air are not mixed in proper proportions until they reach the interior of the

Both inlet and exhaust valves are operated by one lay shaft paralleling the engine cylinders and geared 2 to 1 direct to the main shaft. A flange coupling near the driving end permits of small angular adjustment in either direction for facilitating proper valve setting. The main drive for this lay shaft is a spur gear mounted close to the main bearing upon the main shaft. A cross shaft extending beneath the crank pit transmits this motion to a 2 to 1 bevel gear drive. As a substitute for spiral gear drive, formerly employed, this construction seems to be a decided improvement.

For sensitive governing, the regulator must not be required to actuate valves of large mass or dimensions. In this engine an oil relay system has been developed in which a reciprocating piston, operating under 40 to 50 pounds pressure, does the actual work of moving the inlet valves. It is controlled by a small pilot valve which is alone actuated by the regulator, and as this is balanced the regulator does very little actual work. A powerful and sensitive centrifugal type regulator is driven direct from the main lay shaft through a cushioned gear.

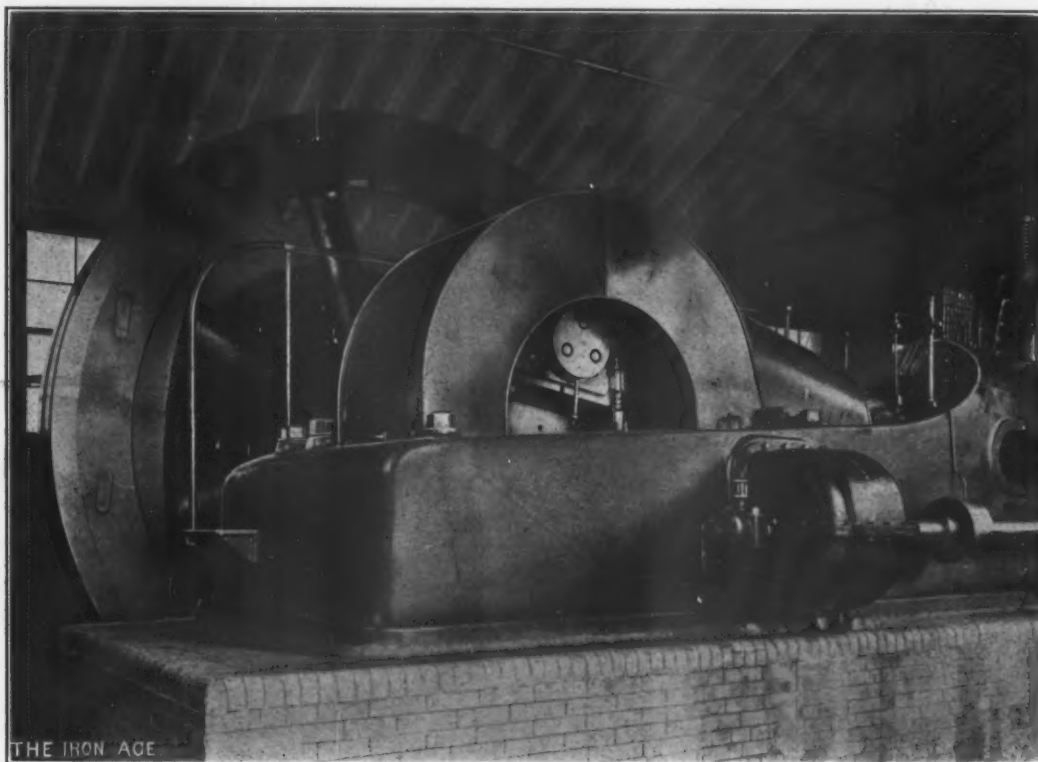


Fig. 3.—A View from the Fly Wheel End.

valve itself, which reduces the possibility of premature firing. There are two distinct motions of the valve: a vertical one opening the gas and air ports to the cylinder, and a rotating one which proportions the quantity of mixture to the load. The proper ratio of gas to air is maintained constant by butterfly dampers in the separate gas and air ducts leading to the individual valves. As each valve is directly under governor control, the engine can take only such volume of mixture as is needed at the instant to maintain speed; closer regulation is thus more readily obtained than where the governor valve and inlets are farther apart. A valuable feature of this valve is that a somewhat richer mixture is obtained on very light loads to insure greater certainty of ignition. The exhaust valves are driven by separate eccentrics. With a special form of multiplying motion two desirable features are obtained, concentration of lifting force, as the valve leaves the seat against the heavy exhaust pressure, and rapid opening as soon as the valve has left the seat. With a comparatively light linkage, great power is exerted at the start, followed by maximum velocity of opening when most desired. The valves are of solid cast steel resting in a cast iron yoke, with ports for conducting the cooling water. This water rises through the center of the valve and discharges downward through a concentric tube, so arranged as to always keep the valve full of water.

A separate cushion dash pot attached to the regulator linkage assists in securing staple governing, especially at light loads on the engine. Oil for the relay cylinder is supplied by a small pump connected to one eccentric. This pump discharges into a steel storage tank which is kept partly full of oil. Should pressure gradually diminish, due to leakage, sufficient air is left in this tank to maintain normal pressure—about 40 pounds per square inch.

Two independent ignition systems serve the engine at opposite points in the combustion chambers: the familiar hammer break or low tension, and the jump spark or high tension system. They are complete and separate at all points and each serves the other in a purely relay capacity. A small auxiliary lay shaft, parallel and geared to the main shaft, carries four igniter cams, set at quadrant, for the hammer break system. A valuable detail of this gear is the provision for simultaneously advancing or retarding ignition in all cylinders while the engine is running. This adjustment is conveniently located on the gear case of the drive and a graduated scale and index gives the exact point of ignition.

Current for both igniter systems is received from individual sets of Westinghouse storage batteries, so connected that one is in use while the other is charging, and *vice versa*. These batteries deliver current at 8 to 9

volts to the igniters and spark coils of the high tension ignition system. All igniter plugs are removable in one piece, and any of them may be changed while the engine is running by temporarily cutting off the gas supply from the cylinder end affected and relieving the cylinder compression while the other end of the cylinder is kept in service. A simple and effective device opens all igniter circuits instantly upon the cessation of cooling water supply pressure. This works in connection with an engine safety stop located at the rim of the fly wheel, by which the same switch is tripped by a centrifugal plunger sunk into the face of the fly wheel.

In the circulating system two important features are individual discharge outlets from all the main parts of the engine requiring cooling water, and outlets open to the atmosphere, so that the temperature of the water may be determined from time to time by the attendant, whereby he would quickly discover a stoppage of the cooling water passages. Cooling water is pumped from and re-

the pressure of combustion operating against special check valves at the entry to the cylinders. The engine can be readily brought up to speed inside of one minute by one man and loaded inside of two minutes.

Automatic oiling devices have been applied at every possible point. On each end of each cylinder is a small sight feed plunger pump operated from an eccentric. These pumps are filled from a reservoir located on top of the cylinders, and separate ducts convey oil to several points around the cylinder wall and to the glands. An important point is that cylinder lubrication is accurately timed, so that its effect will not be vitiated by combustion before the lubrication has been accomplished. This also results in a reduction of the oil necessary to about 1 gallon per day. The engine oil is handled by a circulating and filtering system. It is supplied under gravity pressure from an elevated tank to sight feed manifolds on various parts of the engine, and a large excess of oil is used so as to thoroughly flush all working parts, which finally drains back through the filtering system. After thorough filtering and settling it is again elevated to the tank by a small geared pump belted to the main shaft.

Pittsburgh natural gas furnishes motive power and

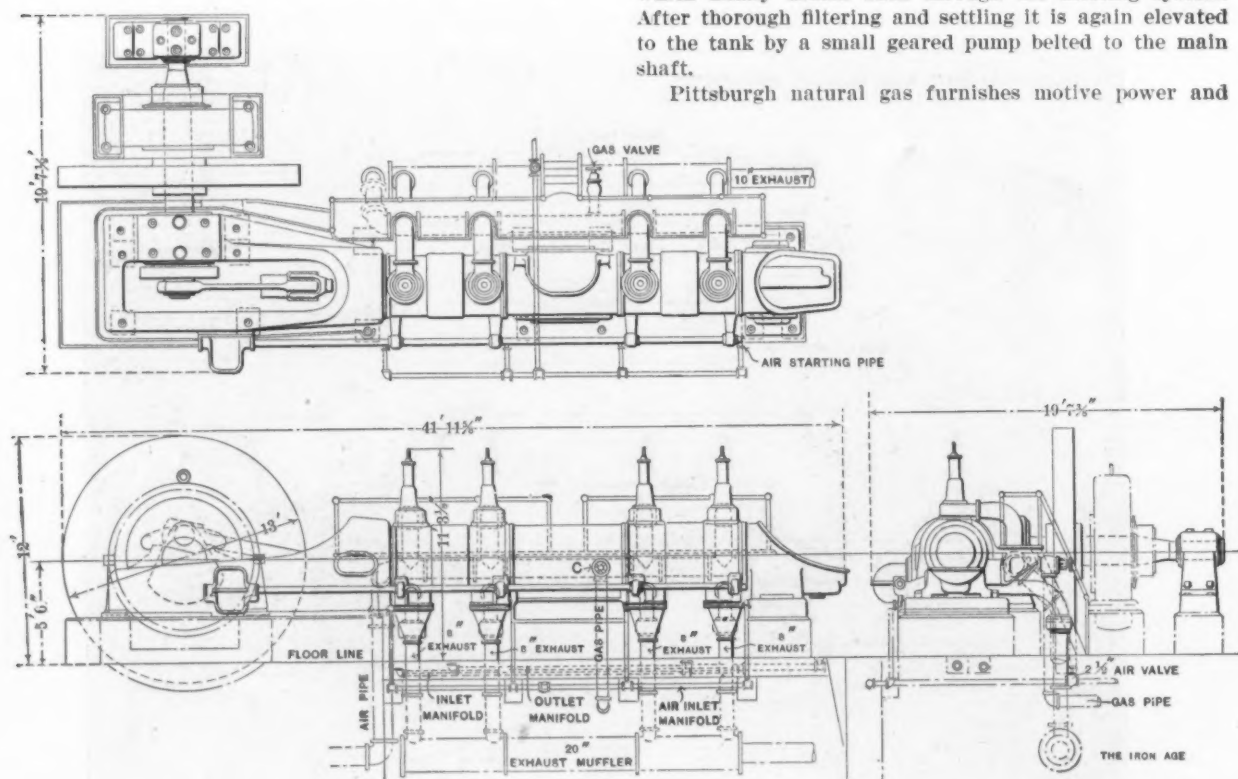


Fig. 4.—Plan and Elevations of the Four-Cylinder Double Acting 500 Horse-Power Westinghouse Gas Engine.

turned to a storage well of large diameter, located in the open, from which heat is dissipated with sufficient rapidity to maintain safe jacket temperatures. As the plant operates normally 15 hours per day, there is considerable opportunity for dissipation of heat in this storage tank during the night time. Should the triplex pumps (which are in duplicate, one driven by a motor and the other by a small gas engine unit) fail, city water is turned into the system by an automatic valve which opens when the delivery pressure falls below 20 pounds.

A special operating feature is the simple method of starting, which is the adoption of vertical gas engine practice. Compressed air storage tanks in the basement furnish motive power at 200 pounds pressure. On the engine lay shafts are four cams, engaging stems of small poppet valves, which automatically inject compressed air into each combustion chamber to give the forward impulse. No manual adjustment of the valve mechanism is necessary. In starting there are but two operations: Opening the compressed air throttle, which sets all starting valves, and opening the gas throttle. Each inlet valve then comes into play in required order. After the first impulse gaseous mixture is drawn into the cylinders in proper proportion, and with succeeding ignitions the engine rapidly comes up to speed. At this point the compressed air is automatically shut off by

heat for the entire Carnegie properties. The gas engine piping contains a Westinghouse proportional gas meter and an automatic gas regulator, in which the supply pressure is reduced to approximately atmospheric. For the large engines diaphragm regulators have been displaced by those of the gasometer type, owing to the difficulty in keeping the former from chattering under the effects of the rapid intermittent suction.

In normal operation one man can easily handle the large gas engine unit with an assistant at the switchboard when starting. The load is controlled the same as with a steam unit. Up to the present time, with the exception of a short run at full load, the engine has been but lightly loaded, under which conditions best results upon a reciprocating engine are difficult to obtain; yet the engine runs quietly, practically without vibration or signs of faulty balancing of parts, and governs with sensitiveness and stability. Owing to the use of labor saving auxiliaries the attendant is enabled to devote a much larger proportion of his time than usual to inspection, with manifestly good results.

San Francisco is to have a 15-story steel building constructed after the manner of a steel ship. All the walls are to be of steel plates. It will be the first building of its kind in the world.

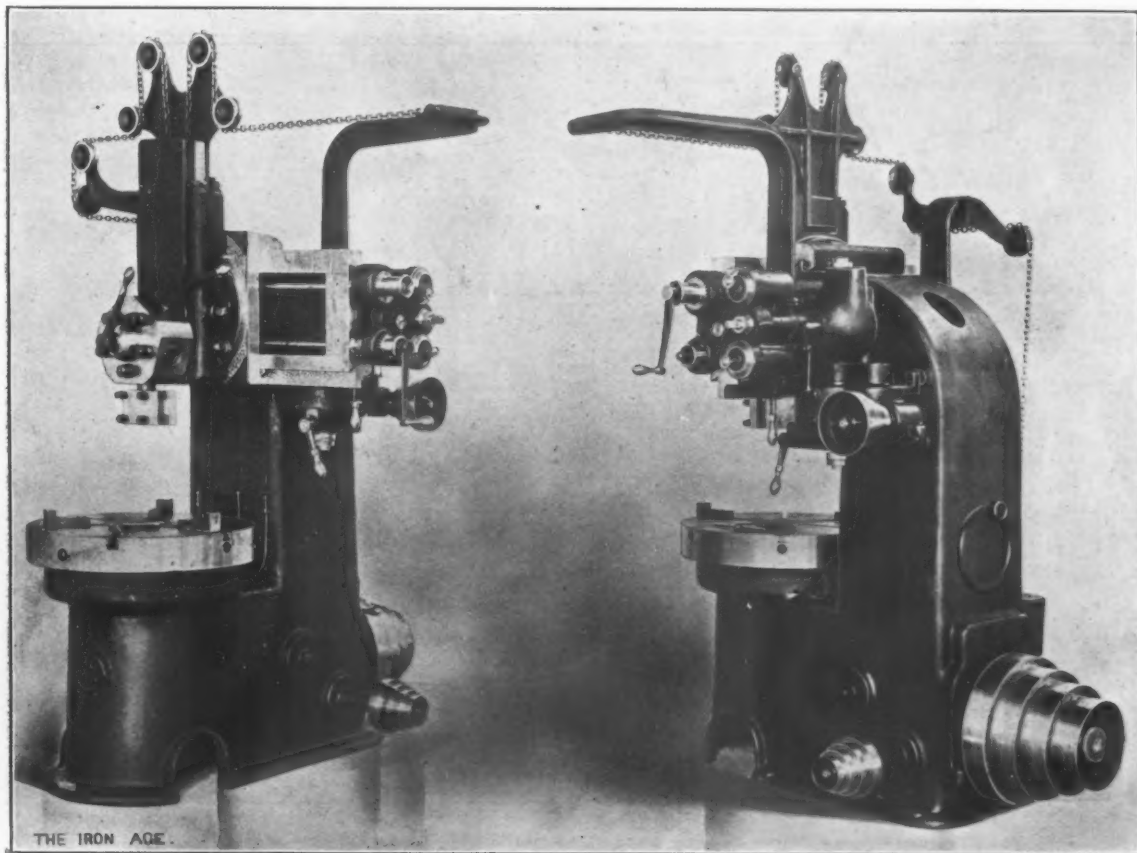
A New Gisholt Boring Mill.

Two views of a 30-inch vertical boring and turning mill recently brought out by the Gisholt Machine Company, Madison, Wis., are shown in the accompanying illustration. In many respects it resembles the 34-inch boring mill described in *The Iron Age* February 16, 1905, but it embodies fewer parts, only those having been retained which are indispensable to a serviceable and substantial mill, so that it may be marketed at a moderate price. Of this mill in common with the line manufactured by the company, it may be said that it has particularly broad bearing surfaces, and a construction that makes for strength and rigidity.

The head stock is driven by a four-step cone pulley. The power is transmitted directly or through back gears which are thrown in and out by positive clutches operated by a lever. Sixteen table speeds are obtainable through the two-speed self oiling countershaft, and eight

in the chair. Attention was called to the convention of the American Foundrymen's Association to be held in Cleveland, June 5, 6 and 7, and the members were urged to send as large a representation from New England as possible. The chair appointed John Magee, B. F. Shaw, Jr., and F. F. Stockwell a committee to make arrangements for attending the convention. Announcement was made that the June meeting would be held in the form of an outing at Point Shirley, Winthrop, Mass. E. M. Taylor of Library Bureau discussed in a practical way "The Correct Application of True Burden to Iron Costs." At the conclusion of his address a rising vote of thanks was extended to Mr. Taylor.

The American Mining Engineers in Germany.—Dr. E. Schroedter of Düsseldorf advises us that a preliminary programme has been outlined for the visit of the members of the American Institute of Mining Engineers to Germany following the joint meeting at London with the Iron and Steel Institute. The members will register at



A 30-Inch Boring and Turning Mill of Simplified Design, Built by the Gisholt Machine Company, Madison, Wis.

feeds, ranging from 0.0156 to 0.25 inch. Any feed may be operated by power or by hand. Micrometer index dials reading to 0.001 inch on both vertical and horizontal feeds facilitate the setting. For stopping the feeds at any predetermined point there is an automatic feed tripping device, which it is claimed will always trip positively at the end of the feed traverse. The table may be a universal and combination chuck fitted with three movable jaws and nine radial T slots, or a plain table with 12 radial T slots.

The turret has five faces, each containing a $2\frac{1}{4}$ -inch hole. The height under the rail is $17\frac{1}{2}$ inches. The floor space required by the machine is 63 x 63 inches, and the extreme height is $92\frac{3}{4}$ inches. The maximum swing is 34 inches, the diameter of the table 28 inches, the total ratio of gearing is $20\frac{1}{2}$ to 1, and the weight 5000 pounds. This machine may be motor driven, if desired. All gears are incased and all those subjected to heavy duty are of steel.

The New England Foundrymen's Association.—The monthly meeting was held at the Exchange Club, Boston, Wednesday evening, May 9, with President W. B. Snow

Düsseldorf on Monday, August 13. On the first day a steamship excursion will be made to the ports of the lower Rhine, which are readily reached from Düsseldorf. These ports handle a tonnage of about 25,000,000 tons per annum, and an opportunity may be offered to visit some of the furnaces and steel works located there. In the evening the Mayor of Düsseldorf will extend an invitation to a musical entertainment. On the second day furnaces, steel works and collieries in the vicinity of Ruhrort and Oberhausen will be inspected, the trip being so timed that the party will be back in time to participate in a dinner. The third day will be devoted to further visits to works or to an excursion to Remscheid, where the Héroult electric furnace is in operation. An occasion will also be offered to inspect the dam, the Muengsten bridge and the Elberfeld elevated road. The fourth day is set aside for a sail on the Rhine from Cologne to Coblenz, with which possibly an ascent of the Drachenfels or the Petersberg will be coupled. We understand that Dr. Schroedter will be at the office of the Iron and Steel Institute at London when the members arrive.

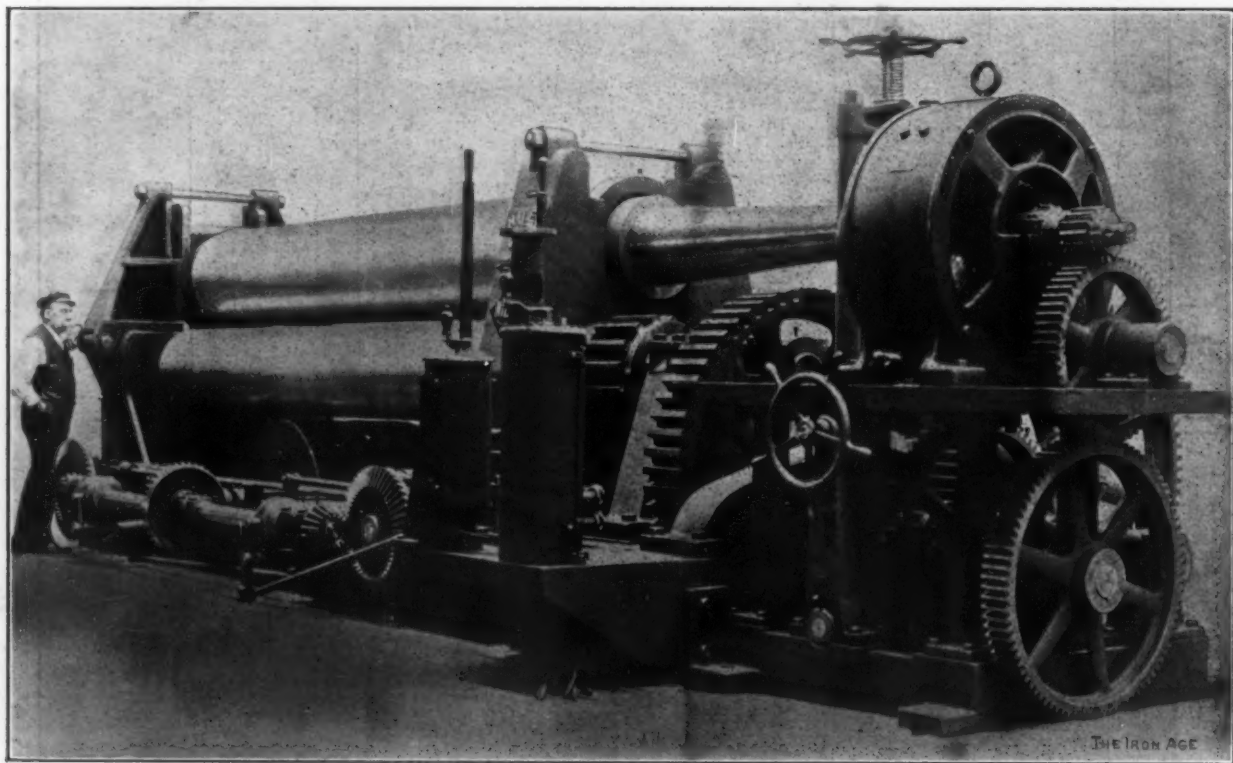
Large Niles Motor Driven Bending Rolls.

Bending rolls are built in a variety of styles and sizes by the Niles-Bement-Pond Company, New York, for bending plates from 5 feet wide and $\frac{1}{4}$ inch thick to plates 32 feet wide and $1\frac{1}{2}$ inches thick. The rolls may be arranged either in pyramid form, or the two initial rolls may be placed one over the other and the bending roll placed at the back. In this latter arrangement the upper and lower pinching rolls are geared together. In the pyramid arrangement the two lower rolls are geared together. The bending roll raises and lowers by power at each end independently for bending plates of different thicknesses and for taper work. One bearing of the upper roll is removable and may be thrown back leaving the roll free for the removal of a ring or flue. In the large machines intermediate supports for the rolls are provided, and engines or motors are used for driving.

The machine illustrated is known as the No. 8, and is built at the Niles works, Hamilton, Ohio. As may be seen, it is a massive machine and is driven by two elec-

through the power company's tunnel, and after this luncheon was enjoyed at the Hospice on the Canadian side. A banquet followed in Toronto that evening. It is this company that contemplates a power transmission to Toronto over the line of the Toronto & Niagara Power Company. Its power house site is in Victoria Park, above the station of the Canadian Niagara Power Company. Its tunnel extends to the gorge under the bed of the upper river, being 1900 feet long. The unit of development adopted for the station is 12,500 horse-power. Ten units will be installed, making the company's proposed output 125,000 horse-power. A portion of the power from this station will be transmitted, it is expected, into New York State by the Niagara Falls Electrical Transmission Company. The capital that is interested in this company is closely allied to the Trans-Niagara Bridge Company, and there is no doubt that the proposed bridge of the latter will form the support for the transmission cables across the gorge.

Associated Foundry Foremen.—For their annual convention, to be held at Cleveland, Ohio, in the first



The Niles No. 8 Motor Driven Bending Rolls, Built by the Niles-Bement-Pond Company, New York.

tric motors, one of 50 horse-power and one of 30 horse-power, and will bend plates $1\frac{1}{2}$ inches thick, 12 feet wide, to 20-foot radius. The 50 horse-power motor is used for driving the rolls and the 30 horse-power motor for raising and lowering the upper or bending roll. The rolls are solid forgings arranged in pyramid form. The lower rolls are geared to run by power, while the upper one is revolved by friction of the plate passing through. The latter is adjustable by power to suit the radius to which the plate is to be bent, and has a hinged bearing at one end, which can be removed. The other end extends beyond its housings to a third support which holds it up while removing work rolled to a complete circle. The housings are carried well up above the bearings of this roll and are tied across the top as the side pressure is very great. The housings are also tied together by longitudinal rods above the sole plate. Suitable levers and clutches are conveniently placed for the easy control of all the operations.

The corner-stones of the power station of the Electrical Development Company of Ontario, Limited, were laid May 8 on the Canadian side of the river at Niagara Falls. Following the ceremonies a trip was made

week of June, just preceding that of the American Foundrymen's Association, which will be in session June 5-7, the Associated Foundry Foremen will have their headquarters at the American House. A programme is in preparation containing an interesting list of papers, and members of the organization will also participate in the discussions of the American Foundrymen's Association. The Foremen's Association has increased its membership from 177 to 356 since the convention of 1904. In the past year two new local associations of foremen have been formed, one at Cincinnati and the other at Montreal, Canada.

Brittleness and blisters in thin steel sheets are discussed by Edward F. Law, London, in a paper read before the recent meeting of the Iron and Steel Institute. The paper indicates exhaustive research, giving analyses and microscopical reproductions, with the following conclusions: 1. Oxidized steel will give rise to blistered sheets, and this defect is more liable to occur with Bessemer than with open hearth steel. 2. Steel high in sulphur and phosphorus will cause brittleness in sheets, especially if the sheets are rolled from large and slowly cooled ingots, in which the maximum of segregation has taken place.

Customs Decisions.

Antimony and Tin Scrap.

In a decision by Judge Somerville the Board of United States General Appraisers on May 12 sustained a protest filed by P. McGettrick, Burlington, Vt., it being held that as the Treasury regulations had been complied with no duty should accrue on an importation of scrap metal which is shown to be a mixture of antimony and tin exported from the United States to Canada and then returned to this country for a process of rolling. It appears from the evidence in the case that the merchandise was shipped in sheets to Girard & Godin, Three Rivers, P. Q., by Manning, Bowman & Co., Meriden, Conn. Later the merchandise was returned to the United States for the purpose already stated. The action of the collector in levying duty is reversed and he is directed to make a proper liquidation, in order that a refund of the duties may be made.

Brass Snaps or Swivels.

On May 12 the General Board granted relief to C. B. Richard & Co., New York, and held that a manifest clerical error cannot operate to assess a heavy duty upon an article. It seems that by error the entry covered by the protest was described under a wrong number, and this led the authorities to collect a duty of 60 per cent. upon brass snaps or swivels which were not plated nor washed with gold. General Appraiser Sharretts holds that the duty should have been 45 per cent., under the provision for manufactures of metal.

Nickel Plated Zinc Sheets.

General Appraiser Fischer has decided that A. Eckstein, Philadelphia, must pay a 45 per cent. duty on nickel plated zinc sheets. The claim for a rate of 2 cents per pound, under the provision for zinc in sheets, is denied.

No Customs Administrative Changes.

The Importers' and Manufacturers' Provisional Committee, which was formed in March to agitate against the so-called Olcott customs bill, has issued a formal statement that as there is no probability of the measure being reported by the Committee on Ways and Means of the House of Representatives no general meeting of protest will be held. The Merchants' Association of New York and importers who favored the modifications in customs procedure embodied in the Olcott bill were very active in their support of the measure, and this resulted in an opposition movement, regarded by many as the reason for nonaction by Congress. Up to the time of the organized opposition to the Olcott bill the impression was widespread that importers as a class were in favor of modifying certain alleged harsh features of the Customs Administrative Act of 1890. This impression was dispelled, however, when a meeting of influential importing interests was held in New York, March 21. At that meeting the Olcott modifications were carefully analyzed and a statement prepared for general circulation giving specific reasons why the bill should not be passed. At the March meeting it was decided to call a mass meeting later for the purpose of opposing the administrative changes. The official statement just issued is taken to mean that there will be no customs administrative changes, for the present at least.

Swedish Iron and Steel Production in 1905.—Statistics for 1905 show that 527,300 tons of pig iron were produced in Sweden in that year, as against 520,300 tons in 1904. Of Bessemer ingots the production was 77,900 tons, against 78,600 tons; of Siemens-Martin ingots 280,200 tons, against 245,500 tons; of wrought iron 178,700 tons, against 189,200 tons. The iron ore exports in 1905 were 3,316,206 tons, an increase of 250,674 tons over 1904. Of the iron ore production 1,072,000 tons were shipped from Lulea from the Kiruna mines, and 1,472,053 tons of ore were carried by rail into Norway, where the ore is shipped from Narvik. The exports of Swedish pig iron in 1905 were 110,400 tons, the largest amount reported for a single year. The total exports of finished products were 387,600 tons, some of the items being the following: Ingots, 15,000 tons; wrought and rough bars, 28,900 tons; bar iron, 192,200 tons; iron wire, 5600 tons; sheet iron, 2400 tons; tubes, 11,000 tons; drawn wire, 1600 tons;

nails, 5400 tons. Projects for the establishment on the west coast of Sweden of iron and steel works are under consideration. The purpose is to enter into competition for a share of the trade in outside markets.

High Duty Metal.

The Western Tube Company, Kewanee, Ill., publishes a pamphlet giving an interesting account of its researches and experiments in producing a copper alloy for the manufacture of brass valves, which would not suffer a heavy reduction in strength with increase of temperature. This loss of strength is not generally taken into account because the deterioration is slow up to a certain point, which is above the temperature of steam or air at the usual pressures, but at the temperature of 150 to 175 pounds of steam the loss begins to be very rapid, and at about 400° F. there is a sudden marked drop in tenacity, which is very rapid to 500 degrees F. In the company's experiments it was found that an alloy that is very commonly in use as steam metal and would be called a fairly good metal for this purpose, showed a drop in tensile strength of as much as 28 per cent. when raised to the temperature of 407° F. Another metal, considered an excellent mixture and frequently used by valve makers for valves of higher grade and designed for higher pressure, showed 22 per cent. loss under the same conditions.

The well known "Government" mixture, as it has been called, consisting of 88 parts of copper, 10 of tin and 2 of zinc, was found to be as little affected by this extraordinary increase of temperature as any alloy which has ever been used, as far as known, in the manufacture of valves. The "Government" mixture was found to have, as an average of a large number of bars tested, a cold tensile strength of 33,633 pounds per square inch. When raised to 407° F. the tensile strength dropped to 30,675 pounds per square inch, showing a loss of nearly 9 per cent.

After making its experiments the company arrived at an alloy which is practically of the same tensile strength as the above mixture when cold, as it shows an ultimate strength of 33,520 pounds per square inch at 70° F., and further, it shows an ultimate strength of 31,627 pounds per square inch at 407° F., the loss being only 5.6 per cent. A table is appended which shows in summarized form the results of these experiments upon six different alloys, with the company's comments, as follows:

Alloy.	Tensile strength at 70 deg. F.	Tensile strength at 407 deg. F.	Loss. Per cent.
No. 1.....	21,790	15,640	28.2
No. 2.....	29,010	22,410	22.4
No. 3.....	24,510	22,059	9.5
No. 4.....	33,633	30,675	3.8
No. 5.....	33,710	31,305	7.1
No. 6.....	33,520	31,627	5.6

No. 1 is the steam metal alluded to above and which is in common use among valve manufacturers.

No. 2 is a metal which we ourselves use at times, and is fairly strong and durable at comparatively low temperatures.

No. 3 represents one of our earlier experiments illustrating the advance along the line of research, but indicates too low tensile strength.

No. 4 is the "Government" mixture, so called.

No. 5 is one of our later attempts, and No. 6 is the mixture which has finally been adopted and will be called by us High Duty metal.

In addition to the rare quality of maintaining the high tensile strength at high temperatures, it is stated that this high duty metal also shows wearing qualities which are very remarkable; it has also been found to be very tough, resisting shock or water hammer with great success; in strength under compression it again showed marked superiority, and further, it makes sound, tight castings.

The company announces that its entire lines of medium pressure brass valves, designed for pressures ranging between 125 and 175 pounds, and its new line of extra heavy brass valves, designed for pressures up to 250 pounds, are now and will hereafter be made of this high duty metal. It is also prepared to furnish any of its goods, now made of its standard brass mixture, made up in this high duty metal.

The Use of Oxygen in Removing Furnace Obstructions.*

BY THE CHEVALIER C. DE SCHWARZ, LIÈGE, BELGIUM.

All experienced blast furnace engineers are acquainted with the great inconvenience, anxiety, and even, in certain circumstances, danger caused by the taphole of a blast furnace becoming closed up by solid iron, so that it cannot be opened by means of the ordinary appliances without a certain lapse of time. There is the danger of the liquid iron accumulating on the hearth of the blast furnace and reaching the slag and the blast tuyeres, thus causing serious disturbances and sometimes explosions. It often becomes necessary to make a new taphole higher up, and to reduce or to stop the blast temporarily, which may result in the formation of scaffolds or other serious inconveniences.

Remedies Heretofore Used.

The case is still more serious if the blast tuyeres of the furnace get closed up by solid iron, either partially or entirely, owing to a scaffold dropping suddenly, or from other causes. Should it in such a case be impossible to get a hole through the iron blocking up the tuyeres within a certain time, a new temporary tuyere, at a higher level, must be applied, and even this remedy often does not have the desired effect. There are, in fact, few cases in metallurgical practice where quick and effective measures are of greater importance and more imminently necessary than those mentioned above.

Hitherto the opening of tapholes closed up by solid iron has usually been effected by forcing a hole through the iron by means of a steel bar driven by hand hammers. If hand methods do not suffice, a heavy ram, suspended on chains and worked by a dozen men, is employed. However, it sometimes happens that the steel bar snaps off, leaving the broken end in the hole already made, or that the liquid iron cools down in coming out, and solidifies in front of the taphole, thus making matters worse than they were before.

Coke and heated blast, as well as petroleum, are sometimes employed for opening a closed-up taphole or tuyere, but these require too long a time to take effect, and, in the case of a tuyere, the latter is, as a rule, utterly destroyed by the operation. A strong electric current of from 400 to 1000 amperes has also been used for opening tapholes, but this method is similarly open to the objection that it does not work quickly enough, besides which it is very expensive.

The Application of Compressed Oxygen

In such cases has completely overcome all these difficulties, as a closed taphole or tuyere can be opened in a few minutes, besides which the method has the merit of being exceedingly simple and cheap, as will be seen from the following description.

The iron to be burned through (pierced) is first heated from outside, at the spot selected for making the hole, by means of an oxy-hydrogen flame which, up to now, has proved to be the most useful for the purpose. It can, however, be replaced by any other combustible gas in case of necessity.

The hydrogen and the oxygen gas are compressed in two separate steel flasks, each flask being provided with a suitable outlet valve, to regulate the pressure and the quantity of the escaping gas according to requirement. The burner consists of an outer and an inner tube, the outer tube supplying the hydrogen, and in the inner tube the oxygen. This simple appliance is worked as follows:

The hydrogen is allowed to escape first, and is lighted, after which the stream of oxygen is turned on. The pressure of both gases is first kept low, but gradually raised and regulated in such a way as to give a very hot flame, which heats the spot upon which it impinges to a white heat. The pressure of the oxygen is then raised to such an extent that the iron commences to burn, which is shown by sparks being thrown about.

The pressure of the oxygen is now further raised to 30 atmospheres and above, while the supply of hydrogen

is entirely stopped. It is now the iron alone which burns, thus replacing the hydrogen as a combustible, whereby, as shown hereafter, a degree of heat is developed which far surpasses that produced by means of oxy-hydrogen gas. The high pressure of the escaping oxygen, at the same time, serves to force out all the molten iron, thus keeping the hole burnt through perfectly clean throughout the operation. It can be shown that a solid block of cold iron or steel, say 16 inches thick, can in this way be pierced within one or two minutes.

Why This Method Is So Effective.

The heating effect of the oxy-hydrogen flame alone is far too low to serve the purpose of opening closed-up tapholes or tuyeres. This is principally due to the fact that (on account of the comparatively great volume taken up by hydrogen) the loss of heat through derivation is much too large, as compared with iron, taking both, as in our case, as combustible matters into account.

On burning one kilogram of hydrogen (with oxygen) 13,057 calories are produced, while when burning iron (with oxygen) only 748 calories are generated. However, one kilogram of hydrogen occupies 87,234 times as much space as one kilogram of iron. Therefore, a certain volume of iron, when burning with oxygen, produces about 5000 times as much heat as an equal volume of hydrogen in equal circumstances.

When iron burns in oxygen the heat evolved is concentrated on a comparatively very small area. This explains the enormously high temperature produced, and the quick action, as mentioned before, notwithstanding that, at the same time, a considerable amount of cold is produced owing to the expansion of the compressed oxygen after leaving the steel flask. This shows itself at the tube leading the oxygen from the flask to the burner, which becomes coated with ice, the temperature of the tube being only about 14 degrees F.

The process above described yields remarkable results when employed for opening a blast or slag tuyere blocked up by iron, because the great heat produced when iron burns with oxygen might lead to the conclusion that the tuyere in question must be melted away, taking the thinness of metal in a tuyere into consideration. This, however, is not the case. Experience has shown that, for instance, a slag tuyere of only 1½ inch inner diameter can be thoroughly cleaned from all the iron adhering to it without being injured in any way. The tuyere does not get heated at all, but cools down, considering that the temperature of the oxygen coming from the tube is, as already stated, reduced below freezing point owing to expansion.

Other Uses of the Oxygen Process.

The oxygen process has been successfully applied for opening tapholes of open hearth furnaces where they have become blocked up with iron or steel. It is of great importance that no delay should occur in tapping an open hearth furnace as soon as the liquid metal has reached the desired degree of decarbonization, as otherwise its composition might change, owing to the delay, to such an extent as to render it useless for the desired purpose. The new process overcomes difficulties of this nature in a few minutes.

Experiments are also being made as to the employment of the new process for improving steel ingots by removing the pipe caused in the upper portion owing to shrinkage during cooling. The crust of solid steel or iron above the pipe is burnt through in the way already described, within less than a minute, and superheated liquid metal of the same quality as the rest of the ingot poured in. This thoroughly fills up the pipe. The experiments are not completed as yet, but the results so far obtained seem to promise final success.

The oxygen process has also been successfully employed in removing deadheads or runners on steel castings. This is of special value in cases where the hardness of the steel casting is such as to resist the action of cutting the tool at the place where the deadhead or runner is joined to the casting.

In rolling mills, where interruptions of work are very costly, the oxygen process can be advantageously employed in melting through and quickly removing any

* Read before the May meeting of the Iron and Steel Institute, London.

broken shaft or axle tree from couplings, fly wheels, &c., instead of causing long delay and expense in doing this work by means of chisels and drills.

The oxygen process has also been successfully employed for piercing armor plates for war ships and armored turrets. This is of special importance in case such plates are of hard metal. A hole through such a plate of, say 9-inch thickness, would require two or three hours if drilled in the ordinary way, while with compressed oxygen this work can be done within 15 to 20 seconds. This remark applies also to the manufacture of hollowed weldless steel goods, either pressed or cast, especially if hard steel is used, where the driving in of a treble might spoil the article in question.

While, as already mentioned, oxy-hydrogen has proved the most convenient for producing the necessary initial heat, before applying the oxygen gas alone, in order to open blocked-up tapholes or tuyeres in furnaces, the electric current has proved more convenient for the same purpose if armor plates, steel castings, &c., are to be pierced. A current of from 4 to 6 volts and 200 to 220 amperes is quite sufficient to produce the necessary initial heat before applying the oxygen.

The oxygen process above described was invented and first practically applied by Dr. E. Menne, engineer to the Cologne Müssener Bergwerks Aktien Verein at Creuzthal, Westphalia. Some improvements have been effected and carried into practical operation by the Société Anonyme Oxhydrique Internationale at Brussels for cutting boiler plates, tubes, &c., so quickly and accurately that the oxygen process has secured favor as a trustworthy method for this purpose. The arrangement consists essentially of two tubes which can be placed one behind the other, the first tube supplying oxy-hydrogen gas and the second oxygen gas. The oxy-hydrogen heats the plate up to a white heat, and the compressed oxygen burns (cuts) the plate exactly as desired. The apparatus for guiding the two tubes works in such an easy and exact manner that the slightest pressure of the finger tips suffices to guide it as desired.

Finally, it may also be permissible to take the financial outlook of the oxygen process into consideration. The principal outlay is that for the oxygen gas, which, at present, costs about 3s. for 1000 cubic feet; but a reduction in this price is expected. For opening a blocked-up taphole or a tuyere, as a rule, not more than 8 or 10 cubic feet of oxygen are required; in exceptional cases, however, from 20 to 40 cubic feet of oxygen gas are necessary. The apparatus itself is very simple and inexpensive. It consists of two steel flasks, each with a reducing valve, and of a few yards of iron tubes and armored hose. Several blast furnace works in England, Germany, Austria, France and Belgium have already adopted the process, with satisfactory results.

The Effect of Copper in Steel.—In a paper read at the recent meeting of the Iron and Steel Institute, F. H. Wigham of Wakefield, England, who is engaged in the manufacture of high class wire ropes, discussed the effect of copper in steel, giving results obtained during the practical working of an open hearth steel furnace. He summarizes the results of the research as follows: "1. Copper is very difficult to alloy with steel so as to obtain a homogeneous mass containing over 2 per cent, even with the addition of aluminum. 2. Steel alloyed with copper in the pure form with the addition of aluminum is not so perfectly mixed as it is when it is added to the charge of steel in the furnace, and more copper could safely be employed provided it was in the metal before it was completely converted into steel. 3. In steel containing 0.5 per cent. or more of carbon it is not of practical value to use more than 0.6 per cent. of copper. 4. The steel with 0.25 per cent. of copper and alloys up to 0.25 per cent. of copper with high carbon (say, of 0.70 per cent.) gives, with or without a high percentage of manganese, a good quality of wire. In conclusion, it may be considered as proved that copper to the extent of 0.25 per cent. is no disadvantage in the manufacture of the best classes of steel wire."

Fireproofed Steel Construction.*

BY WILLIAM SOOY SMITH.

The ease and perfection with which all the parts of steel structures can be accurately proportioned to the strains to which they are to be subjected; the lightness, uniformity, tenacity and unequalled capacity to withstand shocks, vibration and strains varying in intensity and direction; the cheapness and durability when properly used and protected from corrosion and high temperatures, all point to steel as the material par excellence for the tall structures, that have come to stay. These advantages are rapidly becoming well known and recognized by engineers, architects and builders, and the extensive and growing use of steel for bridges and buildings is the legitimate result. With proper precautions in the use and protection of steel in the construction of a building it becomes the lightest, safest, cheapest and most durable edifice that can be built.

Whatever materials are employed in buildings, neglect of correct plans, faulty execution or want of proper protection and preservation is always dangerous and often fatal. There is no mystery in the precise methods to be used in securing first-class steel skeleton structures and protecting them perfectly from corrosion and the injurious effects of high temperatures.

It is now evident that in the countries subject to earthquakes, buildings should, if possible, be so planned and constructed that they will stand the strain produced by the vibrations and movements that occur in the varied materials on which the foundations rest. They also must be fireproofed to save them from destruction by the flames which rise at so many points and that may spread so widely as to bid defiance to all efforts to extinguish them, especially when the whole water supply of a city may be suddenly cut off. Now supposing the building has been planned and built in accordance with the requirements herein set forth, so far as its strength is concerned, but containing combustible materials in the frame structure or materials unprotected that may be so weakened by heat as to fail, the destruction of the building will surely ensue if an earthquake takes place such as that which has just occurred.

The essential characteristics of a fireproofing material for buildings are:

1. It must itself be incombustible.
2. It must be, as nearly as possible, a nonconductor of heat.
3. It must be strong and durable.
4. It must stand heating to redness and plunging into cold water without cracking.

A fireproofing material, possessing all the essential properties enumerated, has been discovered. If the steel skeleton is covered with metal lathing, strong wire cloth or expanded metal lathing, heavily plastered inside and covered with stucco on the outside, roof and all, using an asbestic or other equally good fireproofing material, mixed with quicklime on the inside and Portland cement on the outside, it will be safely protected from corrosion and heat and the stucco will be as hard and durable as stone. In case the plaster and stucco are shattered (which can hardly occur as they are strongly reinforced by the steel lathing) and knocked off by heavy strains or shocks, the steel frame will not be injured nor will life be destroyed by the fall of the small fragments. In the light of these facts it would seem to be very much out of place to load the steel structure with the enormous weight of a heavy and clumsy integument of brick, concrete or stone, which adds but little strength, only great weight, and thus making the building weaker instead of stronger, not safe but more dangerous, less impervious to heat or cold and far more costly, both in foundation and superstructure.

W. A. Wetmore, division sales agent of the Colorado Fuel & Iron Company, is now located in room 232 Bacon Building, corner Twelfth and Washington streets, Oakland, Cal. Orders for that territory are to be given preference by the company.

* Read before the Western Society of Engineers, Chicago, Mar. 16.

A Low Resistance Thermo-Electric Pyrometer.*

BY PROF. WM. H. BRISTOL.

For a great variety of industrial processes and also in scientific research the ranges of temperatures required do not exceed 2000 degrees F. The low resistance pyrometer herein described has been developed to meet the existing demand for an instrument to fully cover this range of temperature; one which would be accurate, reliable and comparatively inexpensive, taking into consideration both the initial cost and the cost of maintenance; also one that might be readily adapted to varying conditions for industrial operations and be successfully operated by an ordinary workman. As the title implies, this pyrometer depends primarily upon the well-known thermo-electric couple, consisting of two dissimilar metals or alloys joined at one end. When the junction of such a couple is located at a point where the temperature is to be measured an electro-motive force is developed, which is a function of and depends for its value upon the difference of temperature at the junction and that at the

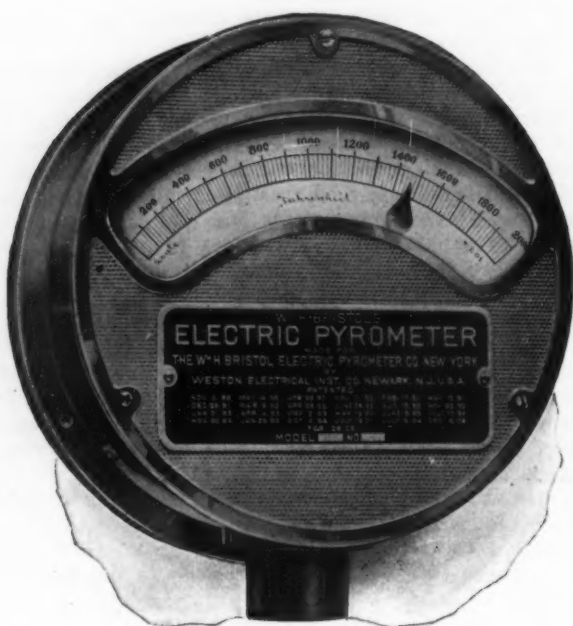


Fig. 1.—W. H. Bristol's Electric Pyrometer.

opposite or so-called cold ends of the two elements forming the couple.

Le Chatelier, who has made extensive researches to determine the most desirable metals for this purpose, finally adopted a couple of which one element consisted of pure platinum and the other of an alloy of platinum and 10 per cent. rhodium, from which couple an almost uniformly increasing electro-motive force is developed with increasing differences of temperature between its opposite ends. These couples are almost invariably used in conjunction with an extremely delicate high resistance galvanometer, 200 ohms being a minimum resistance allowable in the indicating instrument. The platinum-rhodium couple instrument above described may be classed as a high resistance pyrometer when compared with the low resistance pyrometer of which the following is a description:

It consists of three parts: couple, indicator and leads to connect couple and indicator. The leads may be of almost any length. The combined resistance of the leads, couples and indicator is fixed to suit the total range of the instrument and varies from 3 ohms as a minimum to 10 as a maximum. The indicator is a low resistance instrument of special design, made for the writer by the Weston Electrical Instrument Company. Fig. 1 shows a wall or switchboard form of the indicator. These indicators are made with jeweled bearings in

place of the delicate suspension by fine wires used in the high resistance galvanometer.

The elements used in the low resistance system give a much greater electro-motive force than the platinum-rhodium couple. The particular metals or alloys should have a fusing point higher than the maximum temperature to be measured; and when formed into a couple should produce a high electro-motive force with practically uniform increase proportional to the increase of temperature. As the result of many experiments couples have been finally adopted which consist of alloys of tungsten, steel, nickel, iron and copper, different alloys

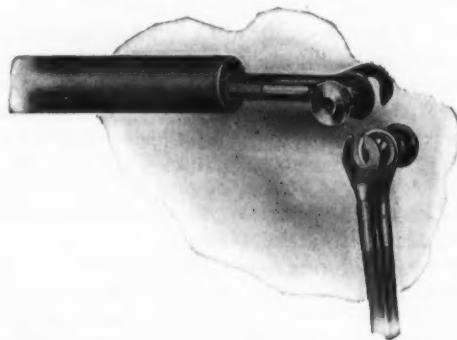


Fig. 2.—Details of the Joint Between the Fire End and Extension of the Couple.

being employed to suit different total ranges of temperature. Since no rare metals are used the couple is inexpensive, and it is possible to employ elements of large cross section, which will not be appreciably affected in their resistance by the variation of temperature along their lengths.

The leads to the indicator are made of flexible insulated copper duplex cable of ample cross section to practically eliminate the influence of variations of atmospheric temperature. The cross section of the elements of the couple is reduced at their junction, thus rendering it sensitive to sudden changes of the temperature to be measured. A novel feature of the couple is that it is made separable at the point where it passes through the wall of the space within which the temperature is to be measured. The joint makes it possible to renew the fire end whenever it may be neces-

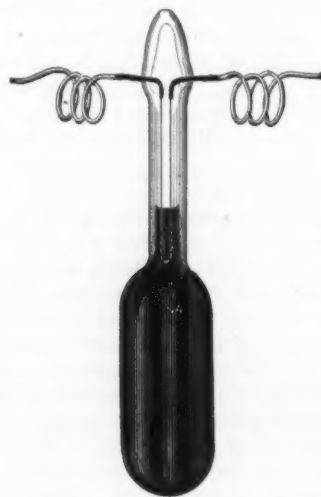


Fig. 3.—The Compensator.

sary and permits carrying the cold ends of the elements to the floor, where the atmospheric temperature will be constant and not influenced by the temperature that is being measured. The joint has large bearing surfaces to prevent variations of resistance at the connection and is easily connected. The details of the joint are shown in Fig. 2, from which it will be seen that it is impossible to make the connection incorrectly.

The low cost of the couples makes it practicable to keep an extra fire end in reserve, which may be quickly

* Abstract of a paper presented at the Chattanooga meeting of the American Society of Mechanical Engineers, May 2, 1906.

substituted for the one in continual service, thus affording an economical and positive check upon the accuracy of the instrument.

The elements of the couple are independently insulated by winding each with asbestos cord and then coating with carborundum paint, a solution of silicate of soda being used as a binder. Couples thus insulated are flexible and can be applied to the heated space directly or inserted into a piece of ordinary pipe as a protection. For continuous applications of the couples to temperatures in the neighborhood of 2000 degrees F. or over special protecting tubes of nickel, plumbago or porcelain are employed.

These pyrometers are furnished with scales for total ranges of 600, 1200, 2000 and 2600 degrees F. The graduations are determined by the fusing temperatures of lead, zinc, aluminum and copper, which give sufficient points on the curves for use in making a complete graduation of the scales. The divisions are further checked by the use of a standardized Le Chatelier platinum-rhodium couple, and a Siemens-Halske suspension galvanometer. For very open scales over shorter ranges several couples may be placed in series, thus making it possible to read to small fractions of a degree.

A novel application of the thermo-electric couple is that of determining the temperature of molten metals,

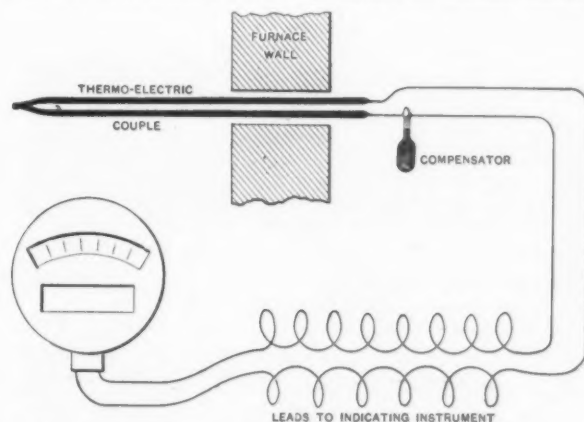


Fig. 4.—Diagram of the Connections of the Complete Apparatus.

as cast iron, copper, brass and bronze. It consists in leaving the ends of the elements disconnected and without insulation. When these ends are slightly immersed in the molten metal it makes a junction between the elements and the reading will be the same as if the elements of the couple had been originally joined. The advantage is that the reduced cross-section at the ends of the couple allows it to almost instantaneously attain the temperature of the molten metal; consequently there is no lag error. As the couple is used over and over again the ends become worn away, but the couple is, nevertheless, always ready for use by immersion of a fresh portion, which will not be changed in any way by continued use and will give the same reading for a given temperature as if the couple had not been worn away. A joint is provided near the end that is immersed so that a fresh tip can be applied to the couple before enough of the end has worn away to appreciably affect the resistance of the complete system.

As the electro-motive force generated by a thermo-electric couple is a function of the temperatures at the hot and cold ends, for refined measurements it is necessary to make allowance for changes of temperature at the cold ends of the couple when readings are taken, unless means is provided to maintain them at a constant temperature. This is sometimes done by immersing the cold ends in ice water or by having a water jacket around the ends, through which there is a flow of water at some known temperature.

In the low resistance thermo-electric pyrometer system, comparatively small changes in the actual resistance of the circuit including couple, leads and instrument will produce sufficient effect to correct for atmospheric changes at their cold ends. A compensating device has been invented which makes it possible to dispense with the means for maintaining the cold ends at constant

temperature. This device is shown in Fig. 3. It consists of a glass bulb with a short stem, similar to an ordinary mercurial thermometer. Two platinum terminal wires are fused into the stem near its top and are connected within the bore of the stem by a loop of fine platinum wire, thus completing the circuit. The size of the bulb, the cross section of the bore of the stem and the cross section of the platinum wire loop are proportioned to suit the case in hand. If the temperature rises at the cold ends the mercury rising in the stem will short circuit a certain portion of the platinum loop, thus reducing the resistance of the entire circuit by the necessary amount, so that the diminished electro-motive force of the couple due to the rise of temperature of the cold end will send the same amount of current through the circuit and instrument and give the same reading as if there had been no change of temperature at the cold ends.

When the temperature falls at the cold ends the resistance of the circuit is increased as the column of mercury lowers in the stem, which prevents the increased electro-motive force of the couple due to the fall of the temperature at the cold ends from sending an increased current through the instrument; therefore the reading remains unchanged. The compensator may also be employed within the indicating instrument to correct for atmospheric changes of temperature upon the instrument itself where extremely accurate results are required. Fig. 4 shows diagrammatically the connection of the parts when in use.

Many applications of this instrument will suggest themselves. The couple can readily be applied to the steam space of a boiler and used to show the degree of superheating. These instruments have also been valuable in maintaining the desired temperatures for annealing, hardening, tempering and bluing of steel. When many small parts are handled a practical method of using the pyrometer is to adapt the pot containing the articles to the end of the couple and use it as a handle for inserting the pot into the furnace or into an ordinary forge fire. They have been most successfully employed in lead hardening baths. Application has also been made to galvanizing baths, affording means for keeping the molten metal at the proper temperature for the work, preventing overheating and wasting zinc by vaporization. They have been used to keep molten lead at correct temperature in the manufacture of shot. Once having determined proper temperatures in furnaces for different classes of work these can always be reproduced and maintained, and it is no longer a matter of guesswork.

For the rapid measurement of the temperatures of objects and metallic bodies the thermo-electric couple may be employed to great advantage. For illustration, if it is desired to obtain almost instantaneous indications of the temperature of a metallic plate, the ends of the elements forming the hot end of the couple may be left disconnected and reduced to points at their extremities. If the pointed ends of such a couple are pressed against the surface of the plate at the desired point the metal will serve as the electric conductor between the end points of the elements, and their junctions will immediately assume the temperature of the plate, giving an instantaneous response on the indicating instrument.

To make the low resistance thermo-electric pyrometer applicable for measurement of temperatures as high as 3000 degrees F., where the couple is to be exposed to the full heat to be measured, metals like those of the Le Chatelier couples or their equivalents, having high fusing points, must be employed. A compound couple, which will serve the same purpose as that of platinum-rhodium, has been devised, but which is less expensive. It consists of two parts, which together form the complete couple. The part which is exposed to the full heat to be measured is made of platinum-rhodium and is of sufficient length to reach a point where the temperature will not exceed 1200 degrees F. From this point to the extreme cold ends of the couple the elements are made of inexpensive alloys. This portion of the couple is of ample cross section to eliminate changes of resistance that would otherwise be produced by variations of temperature along the length of the couple.

Automatic continuous records of the indications of

this pyrometer may be made on a chart sheet which is arranged to move at the proper rate just behind the end of the indicating arm, but not interfering with its natural motion. The record sheet is unsupported over its active portion and is periodically vibrated by the clock movement into contact with the end of the indicating arm and produces a record upon the chart sheet showing its position at the instant of vibrations. By timing the period between the vibrations of the chart the contacts may be made so as to produce a continuous record. The record may be made by ink carried by the indicating arm, or the surface of the record sheet may be coated with some easily removable substance. For recording automatically rapid changes of temperature a current from an induction coil may be passed from the end of the indicating arm through the chart at frequent intervals.

The Pennsylvania Steel Company's Report.

The Pennsylvania Steel Company of New Jersey, the holding company owning the Pennsylvania and Maryland Steel Companies, has issued the following report covering the operations of the mining, manufacturing and railroad companies owned or controlled by it for the fiscal year ending December 31, 1905:

Mining Companies.—The Spanish-American Iron Company, whose mines are located near Santiago, in the Island of Cuba, mined during 1905 422,000 tons of iron ore, compared with 342,000 tons in 1904. There would have been a greater increase in the production had it not been for the scarcity of labor in the Island of Cuba. A considerable emigration of laborers from Spain has now improved matters, and the output of the mines is at a satisfactory rate. The estimated ore reserves at the end of the year were equal to those at the beginning, a very satisfactory condition of affairs.

Manufacturing Companies.—These are the Pennsylvania Steel Company of Pennsylvania, with works at Steelton and Lebanon, Pa., and Maryland Steel Company, with works at Sparrow's Point, Md. All of these works were operated at a normal rate during the last nine months of the year: 748,000 tons of pig iron were made in 1905, as compared with 615,000 tons in 1904, and 847,000 tons of steel ingots in 1905, as compared with 618,000 tons in 1904. The low prices which prevailed during 1904 continued during the early part of 1905, so that the manufacturing companies had the advantage of the present prices only during the last two-thirds of the year.

At the Steelton plant of the Pennsylvania Steel Company the construction of 120 by-product coke ovens has been begun. The completion of these ovens will make all the plants of the manufacturing companies independent, so far as their supplies of coke for blast furnace purposes are concerned. The funds required for the erection of these coke ovens have been provided by an issue of \$1,250,000 4½ per cent. bonds, secured by a mortgage on the coke oven plant. These bonds mature one-tenth each year for ten years, and are payable at any time at the company's option at 102½. At the Steelton plant improvements were also made during the year by the addition of new hot stoves and boilers to the blast furnaces. At the Lebanon plant further expenditures have been made on the ore concentrating plant, which will be completed about July 1. At the works of the Maryland Steel Company a large expenditure was made for improving the blast furnaces. A complete remodeling of the engine and steam plant of the entire works is now under way.

The marine and dock departments completed the floating steel dry dock Dewey for the United States Naval Station in the Philippine Islands, which has been under construction for more than a year. In June last, after exhaustive and satisfactory tests, this great dock, the largest of its kind in the world, was delivered to the United States Government at the testing ground in Chesapeake Bay. It is now being towed by the Navy Department to its station near Manila. There were also completed during the year by the marine department two sea-going dredges for the United States Government, four ferry boats for the city of New York, a sea-going tug and two car floats.

All Companies.—The combined income account of all subsidiary companies for the year ending December 31, 1905, is as follows:

Net earnings from operation.....	\$4,986,248.24
Incidental receipts from rents and income from investments and interest.....	277,717.18
Gross income from all sources.....	\$5,263,965.42
Deduct interest on bonded debt.....	811,562.56
Net income for the year.....	\$4,452,402.86
Deduct charges to depreciation of plants and equipment.....	1,755,191.72
Net profits of subsidiary companies for 1905.....	\$2,697,211.14
Less dividends paid.....	1,164,000.00
Balance transferred to reserve for plant improvements.....	\$1,533,211.14

The balance sheet of the company and its profit and loss account at the close of business May 1 are as follows:

BALANCE SHEET, MAY 1, 1906.

Assets.	
Cash.....	\$507,802.80
Loans to operating companies.....	1,000,021.87
Stocks and bonds.....	26,129,680.26
Accrued interest.....	9,490.67
Total assets.....	\$27,646,995.10
Liabilities.	
Capital stock, preferred.....	\$16,500,000.00
Capital stock, common.....	10,750,000.00
Loans from operating companies.....	221,804.00
Profit and loss.....	175,191.10
Total liabilities.....	\$27,646,995.10
Profit and Loss Account, May 1, 1905, to April 30, 1906, inclusive.	
Expenses.....	\$31,003.42
Adjustment of value of securities.....	200,000.00
Dividends, 7 per cent. preferred.....	1,155,000.00
Balance, April 30, 1906.....	175,191.10
Total.....	\$1,561,194.52
Balance May 1, 1905.....	\$89,989.69
Dividends from operating companies, interest on securities and bank balances.....	1,471,204.83
Total.....	\$1,561,194.52
Balance May 1, 1906.....	\$175,191.10

Semiannual dividends amounting to 7 per cent. have been paid during the year on the preferred stock. No dividend has been paid on the common stock.

Considerable improvements are in contemplation at the works of all the manufacturing companies. These improvements include, for the works of the Pennsylvania Steel Company at Steelton, the construction of a new open hearth plant, which the increasing demand for this kind of steel makes necessary, and for the Maryland works, the equipment of its ore docks and blast furnace plant with the most modern and economical devices for handling raw materials.

The large consumption of coking coal by the manufacturing companies in their coke oven plants has rendered advisable the control and operation of coal mines in the interest of the company. To meet this requirement the Penn-Mary Coal Company has been organized, all of the capital stock of which is owned by the Pennsylvania Steel Company of New Jersey, and this coal company has acquired a tract of about 16,000 acres of coal lands in Indiana County, Pa., which will be developed during the current year. The major part of the funds required for the purchase of these coal lands has been provided by an issue by the coal company of time notes payable in six months, one year, eighteen months and two years, amounting to \$1,750,000. The coal lands thus acquired will make the manufacturing companies independent and secure for many years so far as supplies of fuel are concerned.

The Johnson-Locke Mercantile Company, 862 Clay street, Oakland, Cal., is soliciting agencies from manufacturers of structural, electrical material, sheets, pipe, nails, plumbers' supplies and general hardware, not only for contract requirements, but also for distribution to the general trade. The company maintains branch offices at Los Angeles, Portland, Seattle, Tacoma and Spokane, and also has a New York office at 25 Broad street, with John G. Paton as its representative.

The Lightning Chuck and Tapping Fixture.

Two new devices made by the Mutual Mfg. Company, Bridgeport, Conn., are shown in the illustration herewith. One is known as the Lightning standard taper spring friction chuck, which is an improvement over an earlier form in that it has a safety provision for protecting the drills and taps. A complete chuck may be seen at the extreme right of the engraving, and bushings for it are shown in other parts of the engraving. The other device is known as the Lightning automatic reverse sensitive tapping fixture, which is fitted with a safety attachment and uses a chuck of the spring friction type.

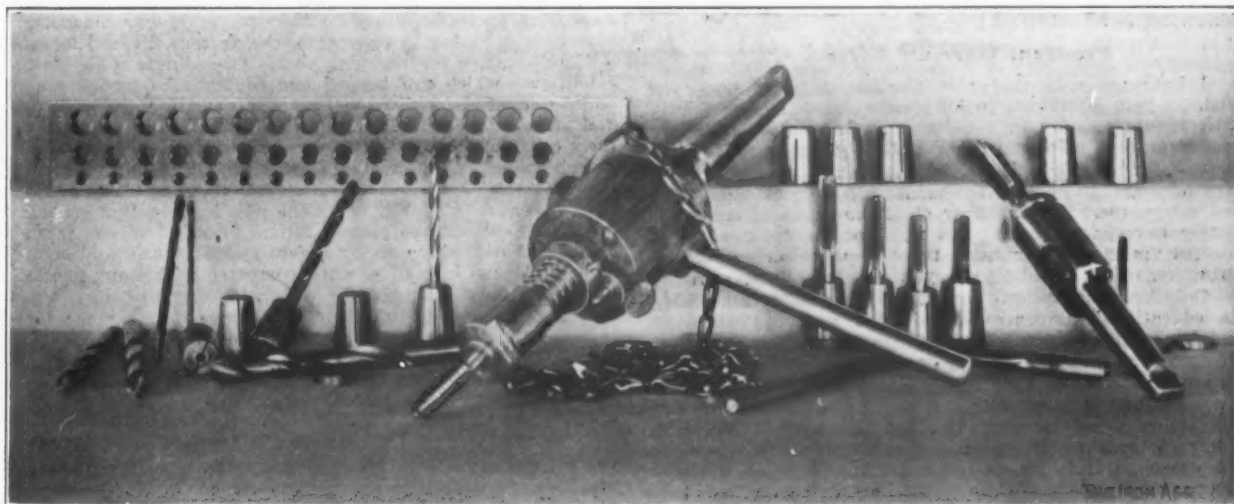
The safety spring chuck is adapted for holding taps and drills up to $\frac{1}{2}$ inch in diameter of shank. It is a simple but safe chuck for preventing the breaking of taps and drills and has the peculiar ability of holding broken drills or taps, as well as those in good condition, which is not true of an ordinary chuck. The tap or drill is held in a split bushing the outside of which is tapered to fit a corresponding taper on the interior of a tightening nut. The nut is threaded on the outside and is recessed into the chuck setting against a shoulder.

The split bushing is backed at the base by two washers separated by an adjustable screw for varying the depth to which the bushing may be inserted. The one bearing

If the tap bottoms or reaches the limit for which the depth gauge has been set, it remains stationary or is reversed at the will of the operator. The exact tapping depth may be set as desired very easily by a nut with a projecting pin running on a thread on the body of the fixture below the frictions, from which point another projecting pin extends down to the depth required. The two pins come in contact when revolving and the nut is unable to turn. The thread carries it in the opposite direction until it comes into contact with a seat in the body of the fixture, then it pulls the friction spindle from contact and the tap ceases to revolve. In reversing the same action takes place in the opposite direction. The device safeguards the tap, for if an obstruction or the bottom stops the tap abruptly the friction releases and ceases to drive it. This allows the tapping of holes to various depths without setting for each one, or the device can be set to tap each piece of the same depth.

The piece of steel with the holes tapped in it, shown behind the fixtures, has 15 holes, each $\frac{1}{2}$ inch deep, of each size: $\frac{1}{4}$, $\frac{3}{8}$ and $\frac{1}{2}$ inch. These were tapped in 20, 30 and 40 seconds, respectively.

A Large Sale of Mill Cinder.—An interesting sale of mill cinder was made recently by E. H. Sprague & Son,



The Lightning Spring Friction Clutch (Right) and the Lightning Automatic Reverse Sensitive Tapping Fixture (Center), Made by the Mutual Mfg. Company, Bridgeport, Conn.

directly against the bushing has a square hole to fit the end of the tap or drill. The adjustable screw is operated through an opening in the chuck near the shank, as may be seen in the tool near the right side of the engraving, by a straight wrench to fit the holes in the nut. By means of this nut the split bushing is placed at a point to give the desired clamping effect when the outside tapered nut is tightened. When the adjustable nut is set the tapered nut is a little loose; usually the adjustable nut can be set so that it will turn with the strength of the fingers, or it may be set as solid as the strongest chuck. The feature of safety is in the spring of the bushing, which allows it to slip if too much work is imposed on the drill or tap. It will be noticed that the working pressure has a tendency to loosen rather than tighten the bushing, this effect being limited by the setting of the adjustable nut backing up the bushing.

The same type of chuck is fitted in the reversible tapping fixture shown near the center of the engraving. This fixture has many features which overcome objections to certain tools of its class. It is designed for high speed tapping in iron and steel of holes up to $\frac{1}{2}$ inch diameter. The chain can be used instead of the long rod projecting from the side, in many places where the rod is in the way, and can be moved very easily from one point to another on radial drills or tools of the same sort. A double friction drives the tap, the upper directly from the spindle of the drill press, and the lower by an intermediate gear. The work is done by the upper friction and the reversing is accomplished by the lower one.

Pembroke, Maine. In nearly 50 years of operation of the old Pembroke Iron Works large quantities of mill cinder were accumulated, and now cover an area of several acres along the river flats adjoining the abandoned mill, which was last worked in 1886. The quantity is estimated at approximately 100,000 tons. The buyers are Boutwell & Co., Boston, and shipments by vessel are being made to Jersey City, Hoboken and Elizabethport, N. J.

The American Boiler Manufacturers' Association.—The eighteenth annual convention of this organization will be held in Pittsburgh September 18, 19 and 20. Headquarters will be at the Hotel Schenley. The convention this year will be one of the most interesting in the history of the association. The committee having the convention in charge is making extensive preparations and reports that the attendance will likely exceed previous records. All boiler manufacturers are invited to attend, whether or not they are members of the association. The American Association of Boiler Manufacturers has done a great deal toward standardizing the material entering into boiler construction, and many abuses have been corrected.

The Society for the Promotion of Engineering Education will hold its fourteenth annual meeting at Ithaca, N. Y., June 29 to July 4, in affiliation with section D of the American Association for the Advancement of Science. Prof. Milo S. Ketchum, Boulder, Col., is secretary.

The National Association of Stove Manufacturers.

This association held its thirty-fifth annual convention at the Waldorf-Astoria, New York, May 9 and 10. The membership was well represented. This convention was notable for the attention given to the subject of costs. Almost every convention takes up some subject, and certainly there is nothing more important than absolute knowledge of the correct cost, a subject which is not thoroughly understood by some of the members, judging from methods they follow. Many are eager for some good system, but are so occupied with details of their business as to be unable to inaugurate and put in operation a proper system of cost computation. Some favor the appointment of a committee to employ an expert to devise a system, and then have the expert visit the different members and superintend its introduction into their business. Though other matters received attention and the convention was voted a good one, the cost question was dominant.

After the roll call and reading the minutes, the following new members were elected:

Advance Stove Company, Evansville, Ind.
Summit Stove Company, LaCrosse, Wis.

President Walter P. Warren of the Fuller & Warren Company, Troy, N. Y., presented his address, of which the following is an abstract:

President Warren's Address.

I have not only the great pleasure, but the honor as well, as your president, to bid you welcome to the thirty-fifth annual meeting of the National Association of Stove Manufacturers of the United States. Since that initial meeting held in New York on May 6 and 7, 1872, momentous changes have occurred—national, political, financial and mercantile. The majority of the founders of our association have passed away; and many of the business methods pertaining to their day have become obsolete—yet the structure, whose foundation they so wisely built, has grown, expanded and flourished until to-day we all acknowledge its educational influences—for it has produced harmony and fraternal relations where doubt and jealousy before existed; it has brought together strong men, whose exchange of opinions and methods have had their influence on the character of our *personnel*; and to-day the members of our association are better citizens, better manufacturers and better competitors in business because of the influence it has exerted. It is for us to cherish its existence, perhaps to broaden its scope, and to honor its founders, who indeed "built better than they knew."

THE IRON MARKET.

The present and future condition of the iron market more particularly concerns our immediate interests. The year 1905 has been most remarkable in the experience of the iron and steel trades of the United States. It has broken all records for production and consumption; and we are entering on the second quarter of the new year with an impetus which apparently assures the continuance of these conditions as far as the immediate future is concerned.

The iron production in the United States during 1905 aggregated 23,000,000 tons, showing an increase of 45 per cent. over that of the previous year, and the largest output ever recorded in the history of the metal. Consumption amounted to 23,062,437 tons, or considerably in excess of the domestic output, proving that a large tonnage of foreign iron was also absorbed in the iron works of the United States.

An interesting article touching the producing capacity of the United States has been contributed by that eminent authority, J. Stephen Jeans, secretary of the British Iron Trade Association. Mr. Jeans says that "the United States has about one-half of the total iron producing capacity of the whole world to-day." The world's output of iron ore is given by him as 55,500,000 tons in 1890, and 92,300,000 tons in 1905, showing a gain of 36,800,000 tons, or 70 per cent., while the corresponding increase in the output of pig iron was 17,470,000 tons. He further says:

One naturally wonders where is this extraordinary progress to end. Is it to be continued on the same scale, or on an even larger scale, in the future? And, if so, what is the larger scale likely to be, and by what countries is it likely to be met? No one who has carefully studied the matter can fail to see that the United States must contribute for the next half century, at any rate, the greater part of any future advance, alike in pig iron and in steel. No other country has the same supplies of cheap and rich raw material. No other country has its conditions of production in such good shape. No other country has such a colossal home demand. No other country can to the same extent enjoy the great benefits attendant on production on a large scale. No other country is better protected from outside competition.

The manifest destiny of the United States, with its vast resources, appears to be to produce more and more largely for export; and, if it is found more profitable to export the finished forms of the material rather than the cruder forms, so much the better for those engaged in the business.

Discussing the question as to whether the present activity is likely to last, Mr. Jeans takes the ground that the boom in the iron and steel trade is not likely to come to an end soon.

The present outlook would seem to warrant a most optimistic view of the iron market for the remainder of the year; in fact, so much business is already on the books of producers that the prosperity of the first half of the present year is assured. But who is wise enough to forecast the future, and though no shadows at present are thrown across the refulgent conditions that are so attractive and seemingly assuring, yet clouds may gather rapidly, and for a space, at least, obscure the future, bringing in its wake a depression for a period, longer or shorter, as its density may determine.

STOVE PRODUCTION GREATER THAN IN 1904.

The prosperity which during the past year has so universally blessed both the product of soil and factory throughout the country, has had its influence on our own particular interests. From reliable sources I am fully warranted in stating that the production of our wares by the members of this association exceeded materially the output of 1904, though I am led to believe that the net profit on the general product fell somewhat below the earnings of the previous year. In most instances this deficiency may be accounted for by the increased cost of material and labor occurring during the manufacturing year.

At the present moment the cost of all material (with hardly an exception) used in the process of our manufacturing runs higher in price than the average for articles of a like character for the past year. Co-ordinate with these conditions, which are beyond our control, the tendency to make our goods with numerous additions for convenience and embellishment and more careful finish is so increasing, their cost that the question may well be asked, Is the ratio of selling prices keeping pace with the increasing costs of manufacturing?

To a casual observer, or to one who has not well considered this subject, the present selling prices of stoves, when contrasted with those ruling a few years since, would seem to be high, and in reality, when compared with many manufactured articles essential for the maintenance of life, comfort and happiness of the race, are above the average; for instance, household furniture of almost every description, glass, crockery, clothing, boots and shoes, &c., the cost of which have been very greatly reduced with the aid of machinery; but, in the art of manufacturing stoves—if it may be so termed—little or no advance has been made in the way of cheapening the product; with few exceptions the various processes, from patterns in the wood to the finished article in the mounting shop, the same methods practically prevail that existed years ago, save some minor adjuncts which by no means can be classed among the wonderful aids of machinery, which have given such an impetus in, and cheapness to, many articles of common necessity.

STOVE PRICES ARE NOT ABNORMALLY HIGH.

The question naturally arises, Are the selling prices for stoves abnormally high, when compared with the present cost of production? An analysis of the proposition would seem to answer the question in the negative—at the same time the prices for which goods are now selling, when contrasted with the low figures obtained, for instance, during the year 1898, would seem to contradict the assertion. I fear the rule too often prevails of predicating the cost of production mainly on the ruling price of pig iron; this is to some extent a fallacious theory, for with the generality of stove foundries the present cost of labor will average from 65 to 80 per cent. of the cost of the production, in accordance with the class of goods made.

For the purpose of illustration: I propose to place the highest grade of an all cast iron cooking range of the present day, manufactured and sold in the district governed by the local association of which the relator is a member, in contrast with a range made and sold 20 years since—in both instances they represent the highest type of article made at the time specified—giving the cost of iron, the cost of molding and the wholesale selling price for the years designated.

For instance, a 1906 pattern No. 9 20-inch all cast iron range, with high shelf, fully complete in every particular, the nickel adjuncts weighing 42 pounds:

Total weight of range.....	611 pounds.
Wholesale selling price.....	\$42.37
Selling price per pound.....	0.069
Cost of molding.....	20 per cent. on board prices.
Cost of pig iron, per ton.....	\$17.50

In 1886 the highest grade range made and sold in the same territory, representing the best type of its class—namely, an 1886 pattern No. 9 20-inch all cast reservoir range and high shelf, fully complete in every particular; weight of nickel parts, 2 pounds:

Total weight of range.....	466 pounds.
Wholesale selling price.....	\$30.50
Selling price per pound.....	0.065
Cost of molding.....	board prices, net.
Cost of pig iron, per ton.....	\$18.75

You will please bear in mind that the molding price given for the range manufactured in 1906 at 20 per cent., added to the board rate, does not really show the proper price of molding as compared with the range made in 1886, because of the fact that of late years the board prices have largely advanced; also that the cost of mounting, polishing, nickeling and all other labor is largely increased in the cost of the 1906 range over the 1886 pattern.

To go back still further, say, five years, to 1881, when the range type of cooking stove was first becoming popular, the highest grade of range made and sold in the same territory and representing the best type of its class—namely, a No. 9 21-inch all cast reservoir range and high shelf, fully complete in every particular, with unpolished edges; weight of nickel parts, 7 pounds:

Total weight of range.....	558 pounds.
Wholesale selling price.....	\$39.69
Selling price, per pound.....	0.071
Cost of molding.....	25 per cent. on board prices.
Cost of pig iron, per ton.....	\$22.58

Note the slight difference in the selling price per pound of the three periods:

6.9 cents in 1906. 6.5 cents in 1886. 7.1 cents in 1881.

These figures may not apply in some instances, because of the diversified trade of the members of the association, but I think they will in some measure prove the assertion that a first-class cooking stove of the present day, with all its modern improvements, conveniences and embellishments, is not selling at an abnormal price, when brought in contrast with prices formerly prevailing for stoves which, for the era they represent, were considered the best of their class.

Therefore, eliminating the cupidity of the occasional grasping retailer, can it be accurately said that the selling price of the best type of modern cooking and heating stove of the present day is abnormally high, when we take into consideration the cost of production, the functions they fulfill and their importance as articles of necessity?

STOVE REPAIR PIRACY.

The president, in his address at your last annual meeting, suggested that a committee be appointed to ascertain if there could be any legal redress for the stove manufacturers against the so-called "repair pirates," and that an opinion be obtained from some competent lawyer on this question. In accordance therewith the following resolution was adopted:

Resolved, That the secretaries of the local associations, together with the secretary of the National Association of Stove Manufacturers, be appointed a committee to formulate a plan of co-operation and action against the repair pirates, and refer the same to the General Executive Committee.

In accordance therewith your secretary called a meeting at the Hotel Astor in New York City September 5, and your president and several gentlemen were in attendance to aid the secretaries in their deliberations.

After a thorough and careful consideration of the subject, it was

Resolved, That we recommend to the General Executive Committee of the National Association of Stove Manufacturers that a legal opinion be obtained as to the probability of an action against the pirates being sustained under the common law, and, if such opinion is favorable, that suit against some pirate be instituted under the common law. (Adopted unanimously.)

And it was also

Resolved, That we recommend to the General Executive Committee of the National Association of Stove Manufacturers that Walter P. Warren, president, appoint a committee to obtain a legal opinion as referred to in the foregoing resolution at the expense of the National Association of Stove Manufacturers; and, in case this opinion is favorable, said committee have power, in conjunction with the Committee on Repair Piracy of the Stove Manufacturers' Association of Pennsylvania, to conduct a suit in the United States Court in equity proceedings under the common law, the cost of said proceedings to be paid by the National Association of Stove Manufacturers. (Adopted unanimously.)

In accordance with the above resolutions, your president called a joint meeting of the General Executive Committee of the National Association of Stove Manufacturers and the National Committee on Repair Piracy, which was convened at the Auditorium Hotel in Chicago on October 23, 1905.

The action of the meeting previously held in New York on September 5 and 6 was laid before the Executive Committee, and they reported to the joint meeting as follows:

Your Executive Committee, having given careful attention to the subject assigned to them for consideration, would respectfully report as follows:

We advise the appointment of a committee by the president to secure an opinion from one or more attorneys as to the advisability of commencing suit under the common law to decide our rights regarding "pirated repairs," and such committee are hereby authorized to expend a sum not to exceed \$2000.

Signed: Walter P. Warren, Thos. J. Hogan, N. H. Burt, G. D. Dana, C. A. DuCharme.

The president then appointed the following committee to carry out the instructions of the Executive Committee: Walter P. Warren, Fred'k Will, Daniel F. Printz, Geo. H. Barbour, Frederic W. Gardner, Thos. J. Hogan, John D. Green, E. C. Hanrahan, and John R. McKnight, secretary.

This committee convened at the Auditorium Hotel October 23 at 3 p.m., and a general discussion ensued as to the question before them, and it was moved and seconded that the president appoint a subcommittee to obtain a legal opinion in the East; and, after this opinion is obtained, a committee be appointed to obtain a legal opinion in the West if necessary. Adopted.

The president then appointed the following subcommittee: Daniel F. Printz, Fred'k Will, and John D. Green.

This special committee was convened at the Waldorf-Astoria in New York November 10, 1905, and it was decided that we should employ Edward M. Shepard of New York City to write an opinion on the subject in question.

The committee again convened at the Hotel Astor in New York on March 30, 1906, at which time Mr. Shepard presented his opinion, and it was:

Resolved, That the committee report this result to the National Association of Stove Manufacturers at its annual meeting, and that Messrs. Printz and McKnight prepare a report to be presented at that time.

The responsibilities attending our business are at times burdensome and the annoyances perplexing, and we may occasionally be regretful of our calling, but I venture to say that any business worth doing has its trials and disadvantages.

Experience brings reliance; and reliance, with a well trained experience, is a most important factor to success. Therefore, my younger hearers, take a deep interest in your business; success comes only to those who are true to their own interests. With diligence couple high aspirations, and remember that your calling is one of dignity, and will bear, to a great extent, the impress of your own character.

Gentlemen, we are indeed citizens of a wonderful country, and live in an age replete with astonishing developments; it seems not at all improbable that the next few years will witness an expansion of commercial enterprises and change of business methods that will surprise even the most optimistic minds of the present days.

Economies are being instituted that were never conceived of before. The co-ordination of similar interests of similar nature are ripe with economies that are impractical in smaller plants—all bearing witness to the advisability of combinations.

The production of our mills and factories would seem to be limited only by their capacity, and with our wealth of material and combined genius we have astonished the world with our products.

Our gold and silver mines yield yearly rich results. The coal and iron ore mined exceeds in value and amount that of any previous year. Labor is receiving its highest award, and is ever reaching out for greater advantages. Individual fortunes have grown to enormous proportions, and the commercial outlook seems practically cloudless, but let us not, in the fullness of this phenomenal prosperity, forget some of the experiences of the past; and, without being pessimistic, counsel conservatism and so avoid those disasters which are often the result of overdoing.

Cost Systems.

A paper on "Improvements in Cost Systems" was read by J. W. Van Cleave, St. Louis. It was to the effect that the association cost system was simple and needed bringing up to date, but unfortunately too few of the members followed any practical system. Several pertinent questions were presented in the paper and it received some discussion. A paper on similar lines by Edmond Raftery, Aurora, Ill., was also read and discussed until the morning session adjourned.

The afternoon was largely taken up by E. C. Hanrahan, secretary of the Western Association of Stove Manufacturers, Chicago, with a blackboard talk on "What Is the Most Correct Method for Determining the Relative Commercial Value of Stoves?" The discussion of this subject and cost systems occupied the entire afternoon session.

Presentation of Other Papers.

On Thursday morning the convention opened and listened to a paper on "Cash Discounts," by Edward Bowditch, Albany, N. Y. This paper was specially directed to the manufacturers and was received with applause. The paper on "What It Costs to Sell Repair Castings," by Abram C. Mott, Philadelphia, received marked attention, and many of the members will, if they follow their present intentions, give thought to its suggestions when they get home, to make application and test some of the ideas. George Mitchell, Pittston, Pa.,

read his paper on "Co-operation Between Local Associations When Members Trade Inside of Home Territory," and the applause indicated that there is promise that the ideas presented will be given practical consideration. The paper of R. S. Wood, Troy, N. Y., on "How to Determine the Value of a Stove Salesman," was well received.

The regular work of the morning session was interrupted very happily. Having profited by ten years of devoted service the members appointed a committee which executed its commission as follows. It procured a handsome open face gold watch, chain and knife charm, the watch with a Phillipe Patek & Co. movement, and in the full spirit of the occasion President Warren made a speech and presented to Ex-President Chauncey H. Castle of the Stove Founders' National Defense Association the committee's purchase. Mr. Castle's surprise was apparent, but he accepted the testimonial with a few remarks clearly showing his high appreciation of his associates' good will. While the convention was in the generous spirit a \$500 increase in salary was voted to Secretary Thomas J. Hogan. The Nominating Committee recommended the re-election of the entire

List of Officers

and they were elected, as follows:

President, Walter P. Warren, Troy, N. Y.; vice-presidents, William G. Henry, Chicago, Ill., William J. Myers, New York, N. Y.; treasurer, Robert L. Morley, Chicago, Ill.; general secretary, Thomas J. Hogan, Chicago, Ill.; board of managers, George D. Dana, St. Louis, Mo.; E. W. Anthony, Boston, Mass.; Charles A. DuCharme, Detroit, Mich.; Edward Bowditch, Albany, N. Y.; N. H. Burt, Leavenworth, Kan.

After voting to hold the next convention in New York City the convention adjourned.

The Stove Founders' National Defense Association.

A very full attendance marked the twenty-first annual meeting of the Stove Founders' National Defense Association, which was held at the Waldorf-Astoria, New York City, on Tuesday, May 8. Not more than two or three of the members of the association were absent. Very great interest is being taken in the work of the association at this time, in view of conditions affecting foundry labor throughout the country. Although the stove trade has been less interfered with by labor troubles than other branches of the foundry trade, there are, nevertheless, quite frequent differences between stove manufacturers and their employees which call for settlement by the representatives of the national organization on both sides. The labor question is thus one of constant interest to the membership of the Defense Association.

Reports of the work of the past year were submitted by President Chauncey H. Castle and Secretary Thomas J. Hogan. These reports are not made public, as they enter into the full details of the transactions of the year. They would therefore hardly be of general interest.

A particularly noteworthy occurrence at this meeting was the declination of President Castle to serve as chief executive officer of the association for another year. Mr. Castle has occupied this position for ten years, and therefore feels that he is entitled to take a rest. He has had a great deal of arduous work during his long term of service and proved himself not only thoroughly competent to handle all perplexing questions which arose, but also zealously devoted to promoting the best interests of the organization. It may well be presumed that the members of the association regretfully part with his services. The election of executive officers resulted as follows:

President, D. McAfee, Quincy, Ill.
Vice-President, Chauncey H. Castle, Quincy, Ill.
Secretary, Thomas J. Hogan, Chicago.
Treasurer, A. C. Mott, Philadelphia.

A new departure was made in connection with the office of the president. He will hereafter be given a fixed salary and will devote his entire time to the work

of the association. Mr. McAfee has for several years participated in the executive work of the organization, and therefore takes up his new duties with ample experience as well as thorough knowledge of the services to be performed. The following district committees were appointed:

FIRST DISTRICT.

E. W. Anthony, Boston, Mass.
A. W. Walker, Boston, Mass.
O. G. Thomas, Taunton, Mass.
W. E. Walker, Taunton, Mass.

SECOND DISTRICT.

Grange Sard, Albany, N. Y.
E. W. Peck, Rochester, N. Y.
R. G. Rennolds, Richmond, Va.
W. D. Snyder, Columbia, Pa.
Henry T. Richardson, New York.

THIRD DISTRICT.

George H. Barbour, Detroit, Mich.
Stanhope Boal, Piqua, Ohio.
S. R. Baldwin, Pittsburgh, Pa.
W. T. Barbour, Detroit, Mich.
Lazard Kahn, Hamilton, Ohio.

FOURTH DISTRICT.

N. H. Burt, Leavenworth, Kansas.
H. A. Viets, Milwaukee, Wis.
Fred Sattler, Belleville, Ill.
R. S. Buck, St. Louis, Mo.

The list of members was augmented by the election of the Advance Stove Company, Evansville, Ind., and the Summit Foundry Company, La Crosse, Wis.

United States First in Exports.

The Bureau of Statistics, Washington, D. C., states that the calendar year 1905 witnessed wonderful strides in the commercial transactions of the leading nations. Most noteworthy was the revelation that the United States, which in 1904 ranked second as an export nation, last year took first rank, and again stands, as in 1903, with the record of selling more goods than any other country in the world. The total imports and exports of merchandise of the principal countries from which they are available, with comparative figures for the previous year, have been tabulated by the British Board of Trade and are here presented. These figures do not include re-exports:

Imports.		
	1904.	1905.
Germany	\$1,548,549,000	\$1,637,577,000
Belgium	520,170,000	561,843,000
France	876,423,000	909,817,000
Switzerland	234,740,000	236,752,000
Spain	162,380,000	190,523,000
Italy	372,526,000	404,576,000
Austria-Hungary	415,254,000	437,557,000
Egypt	102,659,000	107,676,000
United States	1,050,259,000	1,195,470,000
Japan	184,212,000	242,269,000
British India	309,811,000	323,836,000
Canada	245,179,000	261,462,000
United Kingdom	2,339,492,000	2,372,326,000
Exports.		
Germany	\$1,270,799,000	\$1,359,077,000
Belgium	403,725,000	425,600,000
France	866,422,000	926,917,000
Switzerland	171,559,000	186,460,000
Spain	164,794,000	170,848,000
Italy	310,916,000	332,358,000
Austria-Hungary	423,522,000	439,625,000
Egypt	103,914,000	101,661,000
United States	1,445,462,000	1,621,581,000
Japan	156,852,000	158,122,000
British India	510,934,000	499,546,000
Canada	188,723,000	210,875,000
United Kingdom	1,463,410,000	1,606,057,000

It will be seen that the United Kingdom was a close second in exports in 1905, while Germany stood third, but fell considerably under the United Kingdom.

An electric magnet, capable of unloading a carload of pig iron in three hours, with only one man in the crane, is installed at the Buckeye Engine Works, Salem, Ohio. To unload this amount by hand required the services of six men for six hours.

The Hulley Friction Clutch.

Simplicity of construction and easy adjustment of working parts were the ends sought in designing the friction clutch built by the Hulley Foundry & Machine Works, Marion, Ind. The clutch is shown assembled in Fig. 1, and partly unassembled in Fig. 2, to show its parts. As will be seen from the latter illustration, it consists of an outer shell with a split friction band in-

the shipper mechanism. When the operating handle is thrown toward the clutch the arm of the expansion pin rides up on this wedge and turns the pin so as to expand the friction band. An adjusting screw in the end of the arm regulates the expanding action of the pin, and is used for taking up any wear that may occur. This wedge is bolted to the shifting sleeve, which is limited in its movement away from the clutch by a stop collar on the shaft.

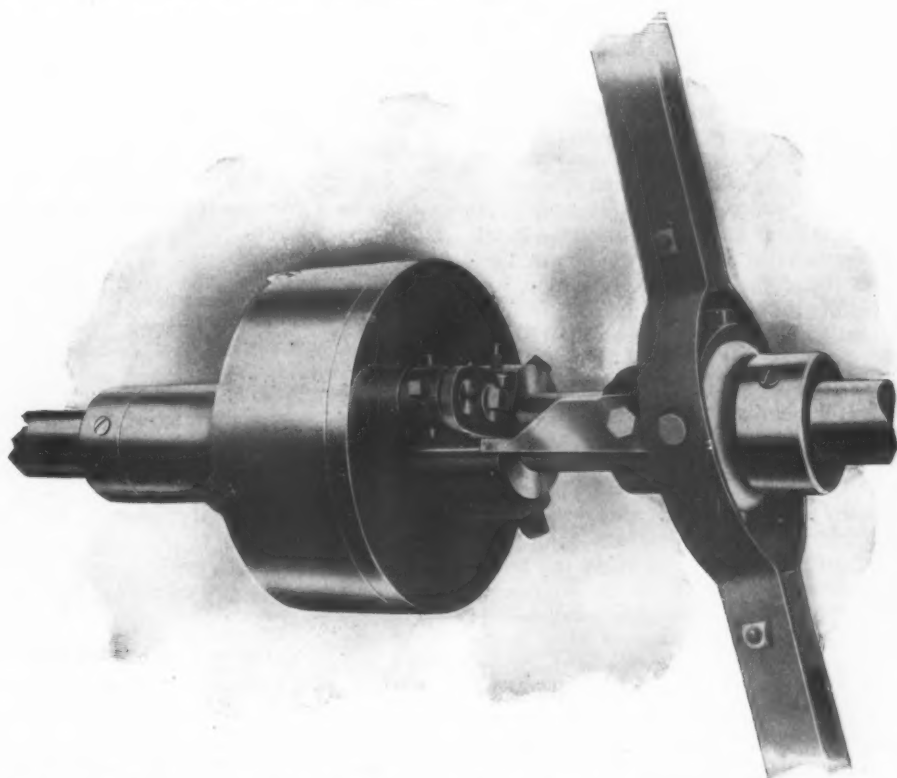


Fig. 1.—The Friction Clutch Manufactured by the Hulley Foundry & Machine Works, Marion, Ind.

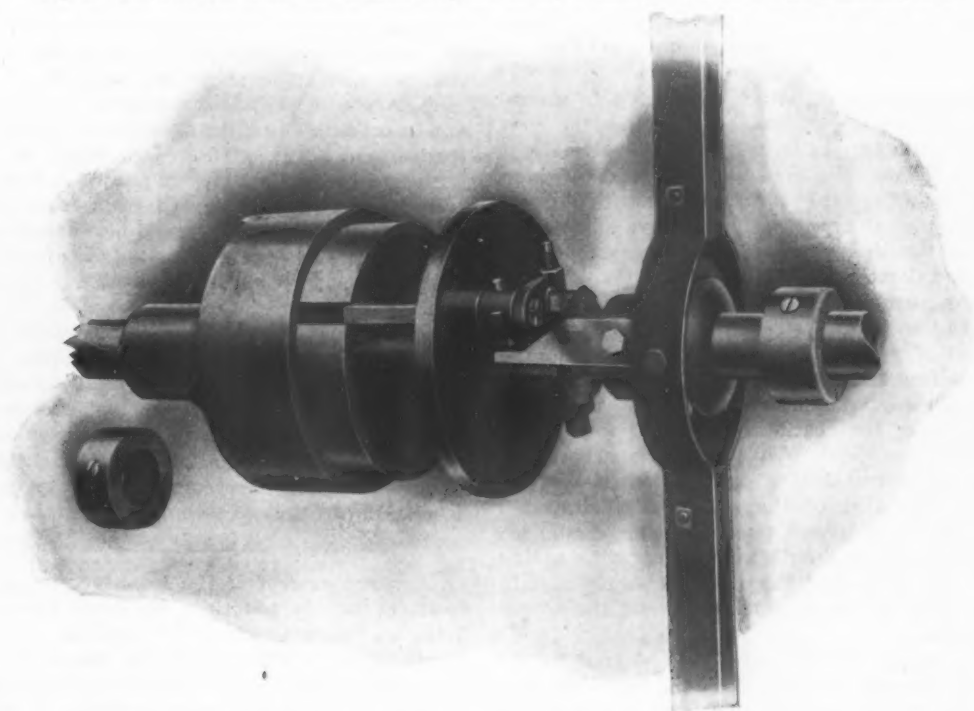


Fig. 2.—The Clutch with the Outer Shell Slipped Back to Expose the Internal Parts.

side and a cover which forms one end of the shell and also holds the friction band in place. An expansion pin flattened on two sides is keyed to a latch and passes through the end cover, entering between the ends of the friction band. By turning this pin the friction band is expanded and engages the outer shell.

The end cover is fastened to the shaft, either by a key or set screw. The arm, which turns the expansion pin, is rocked by contact with a wedge connected with

The clutch is loose on the shaft when not in use, and is provided with four equidistant radial reservoirs. When not in operation the oil flows through the sleeve to the shaft from one and sometimes more of these reservoirs, according to their position at the time the clutch was stopped. This clutch can be used with gears, sheaves or sprocket wheels, as well as ordinary solid or split pulleys. Double clutches for countershafts can be operated with one lever which is interposed between the two clutches.

The Shipping Bill's Prospects.

WASHINGTON, D. C., May 15, 1906.—The fate of the shipping bill, so far as the further action of the House Committee on the Merchant Marine and Fisheries at this session is concerned, rests with President Roosevelt. He is now considering the advisability of sending to Congress a special message urging the enactment of the bill before the adjournment of Congress for the summer recess. If he decides that it is advisable to send any message at this time the House committee will report the bill almost immediately and an aggressive campaign for its prompt passage will be undertaken. If, on the other hand, the President regards it as inexpedient to urge the passage of the bill prior to the November elections the measure will probably remain in committee until next December, or may possibly be reported with the understanding that it is to rest on the calendar without action until the next session. In this event the President early next December will call the attention of Congress to the desirability of the proposed legislation, and it is confidently believed that it will then be enacted without delay. It will be remembered that the bill has already passed the Senate, hence there should be no difficulty in securing final action at the short session.

With a view to fully enlightening the President as to the importance of the proposed measure, and especially as to the practical results that will follow from an industrial as well as from a national standpoint, the friends of the measure have laid before him certain data recently gathered, including the testimony before the House committee of Judge Gary, chairman of the Board of Directors of the United States Steel Corporation, a complete synopsis of which was recently published in *The Iron Age*, and statements more recently made to the committee by Frederick W. Wood, president of the Maryland Steel Company, and Admiral Francis T. Bowles, retired, president of the Fore River Shipbuilding Company and formerly chief of the Bureau of Construction and Repair of the United States Navy.

President Wood's Views.

Mr. Wood in speaking of the difference in the cost of shipbuilding in the United States and abroad said, in part:

"If measures are taken which will result in a substantial increase in the volume of work for the ship yards a great reduction in the cost of construction will very promptly follow. We have seen on the lakes, where it is possible to fill the yard year after year with ships of substantially the same type, that prices have approached the cost in the English yards. The same might be true on the Atlantic Coast under the same conditions. Where we have an opportunity, as occasionally occurs, to compare the cost of an isolated structure, a unique structure, with the cost of a similar structure built abroad, the comparison is favorable.

"One of the most striking illustrations of that is in the construction of the floating dry dock Dewey, which was built by my company. We had the opportunity to compare the labor cost in the construction of the dry dock Dewey with that of the shipyards in England, which have built the largest steel docks there, and we have come very close to their labor cost, notwithstanding we pay our men more, and the reason is simply that in that type of construction they have not had the advantage of repetition.

"There is another feature which has entered largely into reducing the cost of construction on the other side, and which will prevail here if the volume of business is increased, and that is the specializing of the construction of the several parts of the ship. In the cheapest tramp steamer building in England the shipyard is simply an assembling point, a place where the frames are put together. The boilers and engines are bought outside, as well as all the auxiliaries and accessories, the winches, steering gear and pumps. Now in our plant we buy the plates, but we manufacture the engines, the boilers and a great many ship appliances, which it is impossible to purchase in this country, because there is not sufficient demand to create the plants to manufacture them. As to

the advantages of building engines, as they are built abroad, an engine maker making a specialty of marine engines will build from 80 to 100 engines of substantially the same type in a year, build them as the Baldwin Locomotive Works builds locomotives, giving out the various parts by contract to workmen on the piece work system. No shipyard building three or four or a half dozen engines in a year can approach the cost attained in that way."

In reply to a question as to the practical effect on the shipbuilding industry of the enactment of the pending bill, Mr. Wood replied that his company had before it several concrete examples in inquiries for large seagoing vessels on which estimates have been made and which are held up pending the result of this bill. "If the bill is passed," he added, "they will be built, while if it is not passed they will not be built."

Statement of Admiral Bowles.

Admiral Bowles stated that the Fore River Shipbuilding Company was "one of the largest shipbuilding yards on the Atlantic Coast, which has been built up under the stimulation of the building of the navy." Continuing, he said:

"We wish to have enough business in the shipyards of this country to be able to make a little money for our employers. We also have a professional interest in being able at some time to build as good merchant vessels at as cheap a price as they do in England. We have had, through the liberality of Congress, an opportunity to come into competition with the English people in the design of war vessels, with results that we hope are satisfactory to Congress. We believe that with the opportunity which this bill would promise similar things can be accomplished.

Relative Cost of Shipbuilding.

"I have had an instance within my own knowledge of the building of a vessel in our shipyard from English plans, in which I knew the exact cost of that vessel in an English yard. We took the greatest pains with our ship, not only to keep an accurate account of the cost, but to keep it as low as possible. The actual facts were that that ship cost us 50 per cent more in our own yard, the cost being kept exactly in the same way as it was on the other side. This ship was completed last December.

"From what I can ascertain the wages in our yard are from 50 to 75 per cent. higher than they are in the English and Scotch yards. With regard to materials at the present day, the state of affairs is that steel delivered in an English shipyard costs from 15 to 20 per cent. less than ours. It should be remembered that the price of steel has not a great influence upon the cost of a vessel, which you can see from the fact that in an ocean going steamer the proportion of the cost of the structural steel to the whole cost is about 15 per cent., and therefore a small variation in the price of steel will make very little variation in the total cost of the ship."

It is the present expectation that President Roosevelt will within a fortnight decide the question as to whether he will transmit a special message to Congress regarding the shipping bill. Present indications point to the adjournment of Congress soon after June 15. W. L. C.

A paper describing the manufacture of solid rolled steel car wheels and tires, by Peter Eyermaun, Beloit, Wis., was read at the recent meeting of the Iron and Steel Institute. Mr. Eyermaun described the methods employed in making cast iron car wheels by the Pennsylvania Railroad Company, at South Altoona, Pa., and the American Car & Foundry Company, at Terre Haute, Ind.; solid forged car wheels by the Solid Steel Tool & Forge Company, at Pittsburgh; solid steel car wheels by the American Car & Foundry Company, at Duquesne, Pa., and solid steel car wheels by the Schoen Steel Wheel Company, at McKees Rocks, Pittsburgh, Pa. The author refers to the fact that descriptions of practically all these processes have been given in *The Iron Age*, but the combination thus presented forms a comprehensive chapter in the history of the development of the car wheel to meet the requirements of the heavy cars now in use.

The General Electric Company.

The fourteenth annual report of the General Electric Company, covering operations for the fiscal year ending January 31, 1906, has just been issued. In a preliminary statement President C. A. Coffin calls attention to the several topics reported upon by the vice-presidents.

An abstract of First Vice-President Eugene Griffin's report is as follows:

Sales and orders in comparison with previous years were as follows:

Year ending January 31.	Amount billed.	Orders received.
1901.....	\$28,783,275	\$27,969,541
1902.....	32,338,036	34,350,840
1903.....	36,685,598	39,944,454
1904.....	41,699,617	39,060,038
1905.....	39,231,328	35,094,807
1906.....	43,146,902	50,044,272

Heavy traction motors include motors of from 125 to 200 horse-power capacity, such as are used on the Manhattan Elevated and the Interborough Subway of New York City, operated in conjunction with the Sprague-General Electric train control system. During the year we have received orders for over 300,000 horse-power of such motors. Our orders for all railway motors for the year were about 750,000 horse-power capacity.

The increase in Sprague-General Electric train control is shown as follows: Total number of cars equipped January 31, 1904, 2,595; January 31, 1905, 2,997; January 31, 1906, 4,026.

While our factory facilities for the production of Curtis steam turbines have been greatly increased, it has been impossible to keep pace with customers' requirements, and considerable business has been lost through our inability to make the deliveries demanded. Up to February 1, 1906, we had received orders for 535 turbines and had shipped to customers 346. During the past year, in addition to sales of 214 turbines to our domestic customers, we received orders for 44 turbines from 11 of the principal foreign countries. These foreign contracts were secured in competition with all the turbine manufacturers in Europe and elsewhere.

The New York Central locomotive, the first of an order for 35 100-ton locomotives for the operation of the New York Central terminal, has, during the past year, undergone a mileage test conducted by the officials of the New York Central Railroad Company on the tracks of that company west of Schenectady. On January 31, 1906, the total mileage was 29,568 miles. The total maintenance cost, as reported by the New York Central Company, is only about one-fourth the average maintenance cost of a steam locomotive.

The outlook for the coming year is promising. The orders for February and March exceed the orders for the same months of 1905. There is every indication that our business for this year will tax our maximum factory capacity to the utmost. Our unfilled orders to-day are considerably in excess of such orders at any other date in the history of the company.

An abstract of Third Vice-president E. W. Rice, Jr.'s, report is as follows:

Expenditures aggregating \$2,338,362 have been made during the year for real estate, erection of new factories, extensions to existing buildings, additional machinery, patterns, special tools, furniture, &c.

The following table shows approximately the floor space and the number of employees in 1902, 1905 and 1906:

	Floor space. Square feet.	Employees.
1902.....	2,500,000	15,000
1905.....	4,100,000	18,000
1906.....	4,350,000	22,500

One of the notable contracts which we have taken during the past year is for the electrification of the West Jersey & Seashore Railroad, between Camden and Atlantic City, N. J., a distance of 64 miles. This is the first instance of the electrical equipment of an important steam railroad from terminus to terminus. The contract covers the complete installation, including buildings for power house and substations, motors, car equipment, and everything pertaining to an electric railroad system.

The operation of the single phase alternating current

railway motors which we have sold has proved entirely satisfactory. Our engineers have adapted the Sprague-General Electric multiple unit control to the operation of these motors with great success. We have continued to improve the design of our switchboards for the control and regulation of electrical energy and have received most of the important orders for such work. Our metallized filament incandescent lamp, invented by the chief of our research laboratory, constitutes a most important advance in the art of electric lighting.

An abstract of Treasurer Henry W. Darling and General Auditor Edward Clark's financial report is as follows:

During the year there was expended in acquiring sundry patents, for the use of patents and in patent litigation \$431,247.13, which has been treated as ordinary expenses of the year. In addition, the amount of \$1,000,000 has been charged to profit and loss, leaving the company's patents, franchises and good will standing at \$1,000,000.

The income account for the year ending January 31, 1906, compares as follows:

	1906.	1905.	Increase.
Total sales.....	\$43,146,902	\$39,231,328	\$3,915,574
Expenditures and depreciation	37,025,347	33,528,136	3,497,211
Profits and sales....	\$6,121,555	\$5,703,192	\$418,363
Royalties, dividends and interest	1,099,321	810,098	289,223
Year's profits.....	\$7,220,876	\$6,513,290	\$707,586
Sales of sec'ts.....	173,389	281,927	*108,538
Total income.....	\$7,394,265	\$6,795,217	\$599,048
Interest on debentures...	75,105	75,672	*567
Balance	\$7,319,160	\$6,719,545	\$599,615
Written off.....	1,000,000	759,654	240,346
Balance for dividends	\$6,319,160	\$5,959,891	\$359,269
Dividends	3,861,062	3,684,384	176,678
Surplus	\$2,458,098	\$2,275,507	\$182,591
Previous surplus.....	9,569,197	7,293,690	2,275,507
Total surplus.....	\$12,027,295	\$9,569,197	\$2,458,098

* Decrease.

The consolidated balance sheet as of January 31, 1906, is as follows:

Assets.	
Cash	\$6,356,093.77
Stock and bonds.....	\$19,104,539.30
Real estate (other than factory plants)	359,013.86
Notes and accounts receivable....	16,287,018.01
Work in progress.....	2,496,205.78
	\$38,246,776.95
Merchandise inventories:	
At factories.....	\$14,983,710.46
At general and local offices	1,782,678.47
Consignments	155,901.91
	16,922,290.84
Factory plants.....	\$8,000,000.00
Patents, franchises and good-will.	1,000,000.00
	9,000,000.00
Total.....	\$70,525,161.56
Liabilities.	
3½ per cent. gold coupon debentures..	\$2,047,000.00
5 per cent. gold coupon debentures..	55,000.00
Accrued interest on debentures....	458.33
Accounts payable.....	2,106,863.89
Unclaimed dividends.....	1,794.25
	\$4,211,116.47
Capital stock.....	54,286,750.00
Surplus	12,027,295.09
Total.....	\$70,525,161.56

All the company's plants are free from mortgage or other lien, the company has no note payable and the past year it has not borrowed money or incurred obligations, nor has its credit been used either by issuing notes, indorsing customers' paper for discount or lending its name in any way. Its established policy of maintaining sales on a basis of cash or short credit to desirable customers has been adhered to.

In connection with the tour of inspection of the National Tube Company's officers last week the statement was made at Lorain, Ohio, that the company would spend \$500,000 in improving its docks at the Lorain plant. This is about the amount spent in 1905. The improvements look to the doubling of the present capacity of these docks. The tube works at Lorain are producing 1000 tons of finished product a day.

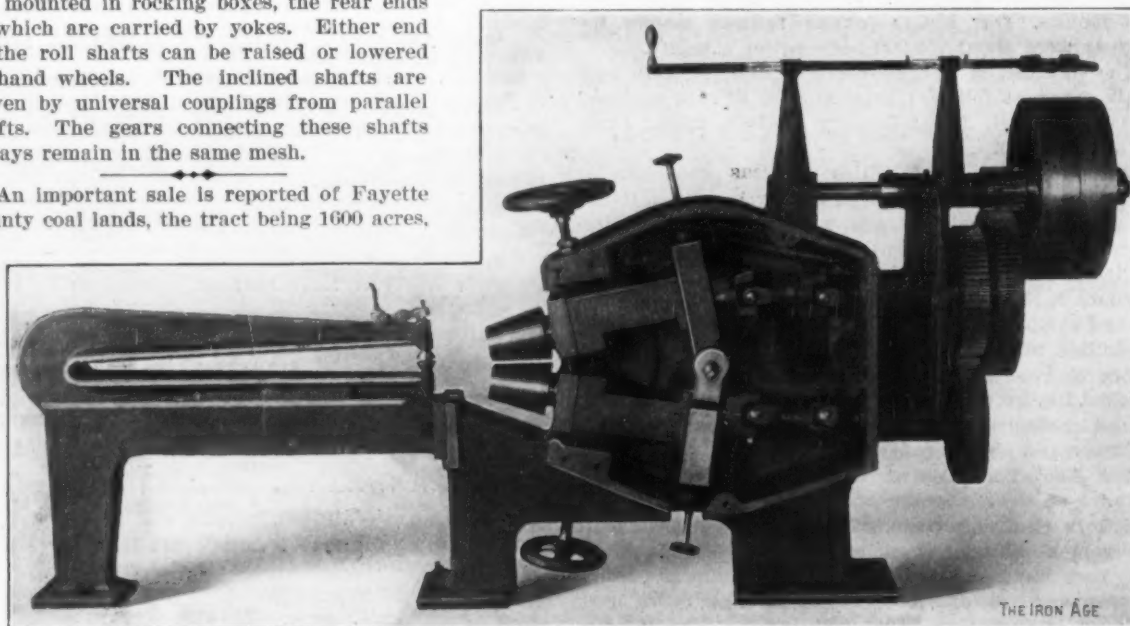
The Niagara Metal Gasket Corrugating Machine.

The accompanying illustration shows a machine designed by the Niagara Machine & Tool Works, Buffalo, N. Y., for corrugating gaskets of light sheet copper, steel or brass. The material is previously cut into disks of proper diameter by circle shears of a type that is suitable for cutting internal circles, as the shears are also used for cutting out the center after the rim is corrugated, unless the inside diameter is so small that the holes must be punched out. The arm in which the material is clamped while being corrugated is adjustable for disks from 3 to 48 inches diameter.

The conical rolls are made to conform with the desired shape of the corrugations and at one rolling will corrugate up to a width of 5 inches. It is an important feature of the machine that both shafts are inclined and that the angle of the shafts can be varied as may be required to give the proper position of the corrugating rolls for work of different diameters, so that the material can be pinched more or less in the inner or outer corrugations.

The illustration shows the machine with the casing that covers one side of the corrugating head removed. It will be seen that the roll shafts are mounted in rocking boxes, the rear ends of which are carried by yokes. Either end of the roll shafts can be raised or lowered by hand wheels. The inclined shafts are driven by universal couplings from parallel shafts. The gears connecting these shafts always remain in the same mesh.

An important sale is reported of Fayette County coal lands, the tract being 1600 acres,



A Machine for Corrugating Metal Gaskets, Built by the Niagara Machine & Tool Works, Buffalo, N. Y.

the price \$1400 an acre, and the total consideration \$2,224,000. The owner of the coal was J. V. Thompson, and the purchaser is Charles Donnelly, acting for the Thompson Connellsville Coke Company of which he is president. This coal lies in the Dunlaps Creek Valley, in the basin of the southern or Klondike coking field, and almost adjoins the Republic Iron & Steel Company on the east, the United States Steel Corporation on the north, the H. C. Frick Coke Company (Lambert Works) on the south and J. V. Thompson on the west. Sites have been chosen for the location of two modern 400 oven coke plants, with necessary houses, &c. The Thompson Connellsville Coke Company consists of Chas. Donnelly, F. H. Richards and W. G. Rock of Pittsburgh and A. A. Thompson and Lloyd G. McCrum of Uniontown, Pa., Mr. Donnelly being president and Mr. Thompson treasurer. The sale was effected by Lloyd G. McCrum, president of the McCrum-Howell Company, Uniontown, Pa. It is reported that Mr. McCrum's profits in negotiating this big transaction were in the neighborhood of \$200,000. Mr. Donnelly was president of the McClure Coke Company before it sold its holdings to the Frick Company.

President Diaz of Mexico has revoked the order of December 30, 1905, by which foreigners were prohibited from filing mining claims in the State of Sonora and the territory of Lower California.

The Open Shop in the Structural Trade.

The National Erectors' Association of Bridge and Structural Iron Workers, an employers' organization, issued a statement through Walter Drew of New York, last week, declaring for the open shop. Since the strike of the employees of Post & McCord, there has been more or less trouble in the building trades, and it is stated that the relations of the employers' association with the Bridge and Structural Ironworkers' Union will not be renewed. The announcement says in part:

The association has decided to conduct work on the open shop plan, making no discrimination between union and nonunion men. This does not mean the open shop as generally understood; that is, the hiring of men by each employer for any wages at which he can get them. The association has adopted a set of working rules, including a minimum scale of wages, hours, provisions for overtime and holidays. These rules will be posted upon every job, and will become part of the contract of every man employed by any member of the association. In New York the scale is 56¼ cents an hour for an eight-hour day. The arrangement will also give the better men greater opportunity to earn what they are really worth, as the wage scale of the association is not a fixed scale, but a minimum scale. Members

must pay at least the scale agreed upon, but are not prohibited from paying more, and a good man will not be held down to the level of a poor or average man.

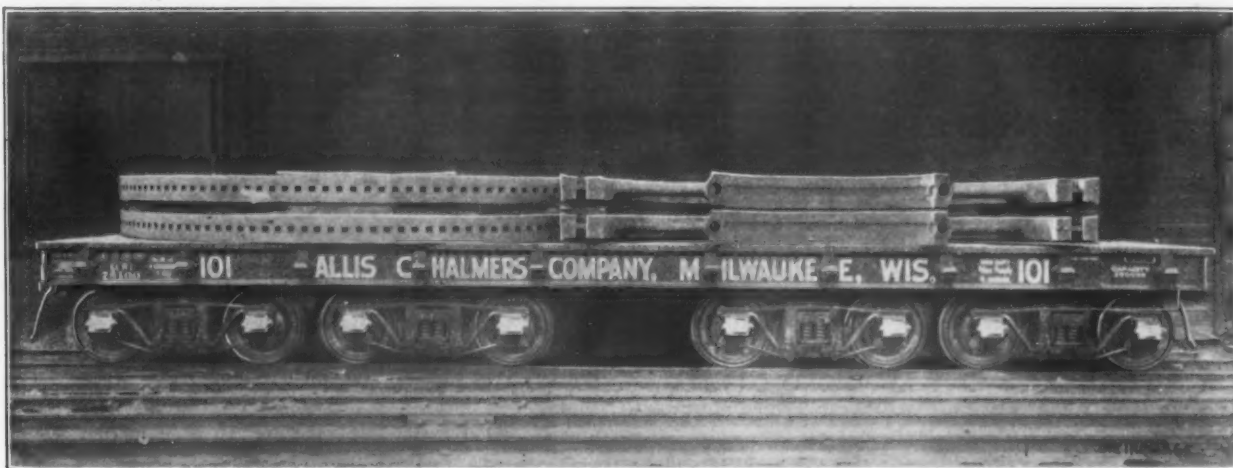
In connection with the open shop plan the association has opened employment bureaus in New York, Pittsburgh and Cincinnati. Others are in contemplation. Registration at these bureaus insures a position to a man as soon as one is open. The present action of the association is dictated more by the consideration of the best interests of the general industry of steel and iron erection work than by any other motive.

It is desired to place that industry upon a safe and stable basis, which it has not had for some time. It is believed that the general public, and especially those contemplating investments in iron or steel structures, will welcome such a development. Substantially all the large iron and steel erecting companies of the United States belong to our association. Among those members are the Pennsylvania Steel Company, the American Bridge Company, the Phoenix Bridge Works, McClintic-Marshall Construction Company, the Pittsburgh Construction Company, the Pittsburgh Steel Construction Company, Fort Pitt Bridge Company, R. & S. Wright, and the Brown-Ketcham Iron Works. Many of the general contractors in the leading cities are working in harmony with the association and its open shop policy.

The statement is made in the foreign trade press that the Belgian rail mills have been dissatisfied with the business coming to them under the international rail agreement, and therefore 4000 tons of 58-pound rails for the West Australian Government will be given to Belgian mills. The Roumanian Government is reported to be in the market for 30,000 tons of rails, which are expected to be distributed among Austrian, German and Belgian mills.

A Special One Hundred-Ton Flat Car.

Difficulties attending the transporting of the larger and heavier pieces of machinery built by the Allis-Chalmers Company, Milwaukee, Wis., has led that company to have designed a special flat car of the type shown in the illustration. The cars used heretofore have been specially constructed of heavy material, with capacities of from 60 to 70 tons. This type of car is practically identical with that employed by the Government for shipping heavy ordnance. Recently the company was confronted with the problem of shipping a huge frame and slide of a monster horizontal rolling mill engine to the Carnegie Steel Company's plant at Sharon, Pa., where it will be installed for heavy service. This single piece, which in the rough casting weighed approximately 133 tons, will weigh considerably over 100 tons when it is finished. It was found that no single car had ever been built capable of carrying it, which made it necessary to design a special car. Orders were placed with the West Milwaukee car shops of the Chicago, Milwaukee & St. Paul Railway for two 16-wheel flat cars of the required capacity, which are the first of their kind in existence.



A 100-Ton Steel Flat Car Built for the Allis-Chalmers Company by the Chicago, Milwaukee & St. Paul Railway.

The following gives the unusual dimensions of these new cars:

Length over end sills.....	40 feet 2 inches.
Width over side sills.....	8 feet 9 inches.
Height, rail to floor.....	4 feet 4½ inches.
Wheel base.....	36 feet 2 inches.
Wheels, diameter.....	33 inches standard.
Journals.....	5½ x 10 inches.
Weight of car, estimated, between.....	50,000 and 60,000 pounds.
Rated capacity.....	200,000 pounds.

The cars are built as low as possible, to allow all the clearance obtainable.

It is decidedly advantageous in building a rolling mill engine, with a capacity like the one in question, to make the frame and slide in a single piece, to secure the greatest possible rigidity and strength to withstand the racking strains of rolling mill service. This piece in the Sharon engine is the heaviest single casting ever poured at the works of the Allis-Chalmers Company, where some of the heaviest steam driven units in the world have had their origin. The pattern for this casting, measuring 32 feet long, 11 feet wide and 10 feet high, represented the work of ten expert pattern makers for a period of over four months. The amount of lumber of various kinds used in it amounted to 22,000 feet. The pit dug in the floor of the foundry at West Allis, in which the casting was poured, was 40 feet long by 15 feet wide and 11 feet deep. The mold into which the molten metal was poured took approximately 133 tons of iron, the actual pouring of which consumed from eight to ten minutes. Nine ladles, four with a capacity of 25 tons each, one 13 tons and four 5 tons each, were used in the operation.

The *Journal* of the Franklin Institute publishes in its current number the concluding chapters of an admirable

address by Dr. Edwin J. Houston, Emeritus Professor of Physics, on "Franklin as a Man of Science and an Inventor."

American Society for Testing Materials.

In connection with further announcement concerning the ninth annual meeting of the American Society for Testing Materials, to be held at Hotel Chalfonte, Atlantic City, June 21 to 23, the secretary, Prof. Edgar Marburg, states that the total membership is now 808. Since the last meeting 171 applications for membership have been received, and, deducting losses by death, resignation and arrears in dues, the net gain is 131.

A committee to nominate officers was appointed recently, consisting of William R. Webster, S. T. Wagner and George L. Webster. This committee has reported the following nominations for the ensuing term, 1906-08: For president, Charles B. Dudley; for vice-president, Robert W. Lesley; for secretary-treasurer, Edgar Marburg; for member of Executive Committee, James Christie. The Executive Committee has appointed the following standing advisory committees to assist in the making of pro-

grammes for meetings and to further the work of committees in their respective lines:

Iron and Steel: Wm. R. Webster, chairman; H. H. Campbell, H. V. Wille.

Cast Iron: Richard Moldenke, chairman; Henry Souther, Thos. D. West.

Cement and Concrete: Clifford Richardson, chairman; Richard L. Humphrey, Spencer B. Newberry.

Brick and Terra Cotta Products: Edward Orton, Jr., chairman; H. O. Hofman.

Preservative Coatings: G. W. Thompson, chairman; Robert Job, S. S. Voorhees.

Tests and Testing Apparatus: Gaetano Lanza, chairman; Mansfield Merriman, Tinius Olsen.

The Atha Steel Castings Company.—In some quarters an erroneous impression seems to have been created by a statement made with reference to the Atha Steel Castings Company of Newark, N. J., in the issue of *The Iron Age* of May 10, page 1533. That statement was that "a large proportion of the output, at least, will in all probability be used by other branches of the Westinghouse interests." The point is made that this might convey the idea that the works are being built primarily to furnish castings to the Westinghouse companies. We are advised that the fact is that the proportion of the output which will go to the Westinghouse companies in the future will probably be smaller than that which has gone in the past, because the total output is being so largely increased. The Atha Steel Castings Company will continue to depend largely upon consumers of castings at large for its business.

B. F. Harper, formerly with the Carnegie Steel Company, has been appointed sales agent for the Fort Wayne Rolling Mill Company, with headquarters at Fort Wayne, Ind.

The Compulsory Working of Patents.

An agitation has been started in England for the compulsory working of patents and much interest appears to have been aroused in the subject. The criticism aimed at the British patent laws also applies to those of the United States, and in a sense with even more force, because while in Great Britain it is possible for any one to obtain a license to manufacture under a British patent, on a royalty fixed by the Board of Trade, in this country a patent remains in force the full period of its life, with no obligation to the patentee to manufacture his invention, nor with any right vested in any other person to take the neglected invention and make something of it. At a recent hearing on the subject the advocate of the compulsory working of patents presented the following argument, in brief:

"The object of a patent is to give a monopoly to inventors and thereby encourage industries which would be checked if all devices or systems at once became general property. A patent is a monopoly which is granted by the State in return for something it expects, that the burden of labor shall be lightened and that production shall be increased. The State is entitled to say if it is not getting its share of the bargain, that it must revoke the whole of the monopoly which it conferred. It was certainly never contemplated by the law that injury might be done a trade through its means. Yet such is the case. A German—to take a concrete example—holding a British patent can prevent the manufacture of the patented article in this country [Great Britain], while he is at liberty to produce it himself in his own country and sell it in this. Clearly the progress of industry which the patent laws would assist is thereby hampered.

"We will suppose that the work of 10,000 men is required to supply the wants of this country for this particular invention. Were the goods not imported from abroad the wages of these 10,000 men, the cost of the raw material, the rates and taxes and all the cost of manufacture would be spent in this country. As matters stand, practically all the outlay takes place in Germany, but the money to meet it is drawn from England. Is it not then clearly desirable that a person, be he English or foreigner, who is protected by our patent law should be compelled to exercise the benefits he receives from that law in this country? But the case does not end here, for while we are giving the foreigner a marked advantage he is giving us nothing in return."

The last sentence refers to the provision of the patent laws of most countries, which compels a patent to be worked within a certain period of time, varying in different countries, the penalty being the forfeiture of protection.

In the argument of the English advocates of compulsory working of patents the provision of the English law permitting others than the patentees to work under the patent is put aside with the statement that the machinery of this part of the statute is clumsy and complicated, and, moreover, that it is not by any means the same thing as compulsory working of the patent. In considering this phase of patent laws in relation to the United States the tariff enters prominently into the question in cases where a foreign patentee fails to work his invention in this country and instead manufactures at home and exports to the United States. Yet there is an argument aside from this, and one that probably applies equally well in England, and this is that manufacturers frequently buy patents from inventors and then let the ideas lie idle, oftentimes forever, the purpose being to prevent others from making use of what is not required by the pur-

chasing owner of the patent. For example, a manufacturer may have a perfectly satisfactory method of accomplishing a certain mechanical action in a machine. An inventor finds another method of accomplishing the same result and the manufacturer prefers to pay a round sum rather than have a competitor enter a field which the manufactured device has made quite exclusive. So the new patent is tucked away for good. If there were the right under the law to manufacture under a license, or if the patent had as an obligation the necessity of manufacturing within a certain time, say, one, two or three years, as the periods run in other countries, including Canada, then the public would have the benefit of useful inventions which to-day are valueless.

British Markets and Steel for San Francisco.

The overwrought expectations entertained in some quarters in this country of large immediate benefits to the steel industry through the demand for rebuilding San Francisco were communicated to foreign markets and with surprising results. The Cleveland pig iron warrant market, that late in 1904 and early in 1905 was dominated by the fatuous belief that American consumption would soon be heavy enough to require importations from England, very promptly responded to the efforts of the San Francisco rumor mongers. It was pointed out that American steel manufacturers would import large quantities of British pig iron to enable them to manufacture the heavy extra tonnage of structural steel needed at once for the rebuilding of San Francisco. Thereupon came an advance, not only in warrants for steel making pig iron—even at that, English hematite would not be bought in this country to put into structural steel—but Cleveland warrants, which represent No. 3 foundry iron, also went up. Cumberland hematite advanced nearly 3 shillings, or to 66 shillings, in the week following the San Francisco disaster, and Cleveland warrants in the same week went from 48 shillings 6 pence to 51 shillings. When the conditions as they exist were cabled to England, as taken from *The Iron Age* of the week following the earthquake, the reaction in warrant markets came promptly. But still the belief remained, as stated by the London *Economist*, "that America cannot meet such an exceptional demand unaided at a time when all her iron and steel plant is already reputedly fully employed." This statement relates to the probability of importations into the United States of British or German structural steel.

It is true that a Scotch structural mill has offered its shapes in this country in the expectation that a great pressure would come upon the mills at once for the rebuilding of San Francisco. Deliveries in a few weeks after the receipt of the order were guaranteed, but no inducement as to price was offered. But Great Britain herself is ordinarily an importer of continental shapes, and if any foreign steel were needed at San Francisco it would be more apt to come from Germany or Belgium. But as time passes the diagnosis of the situation as at first made in informed circles is being confirmed. There is no need thus far of domestic mills putting aside any contract work to give preference to San Francisco business, and by the time financial arrangements are made for the rebuilding the mills are likely to be in even better shape than they are to-day to take care of whatever may offer.

Without reference to this latest occasion for stir on the subject it would seem quite time that the phantom of American buying of British pig iron or finished steel were consigned to a long retirement. It has been brought

out on slight provocation on a good many occasions, and always to the sorrow of those who have entertained it. The healthy proportions of the United States Steel Corporation's export shipments and the definite policy for their continuance on a large scale, together with the fact that the rate of iron and steel consumption in this country for nearly a year past has been more than 50 per cent. greater than in 1904, and even at that extraordinary volume has been fully provided for at home, should be sufficiently suggestive on this point.

The Iron Molders' Strike.

The policy of the National Founders' Association to maintain no working agreement with the Iron Molders' Union of North America, which has been pursued for more than two years, was again unqualifiedly ratified at an enthusiastic meeting of this organization held at the Auditorium Hotel, Chicago, Saturday, May 12. Despite the late call, which was issued only four days before the meeting, nearly 200 members were in attendance, representing interests from New Orleans to Montreal and New York to Minneapolis. The sentiment of the meeting was unanimous on the question of defending those members whose foundries have been closed on account of the molders' strike, and the entire resources of the association were pledged to assist them in securing reasonable working conditions in their shops. Nor did the members waver in their stand on the closed shop, as resolutions maintaining the open shop principle were unanimously ratified. Notwithstanding previous reports to the contrary, not a member counseled surrender or even compromise, and a strong determination was manifested to protect the independent molder—whose courage and loyalty have been freely given—with all the means at the organization's command.

Discussion was freely indulged in by nearly all the members at both the morning and afternoon sessions, and there was an absolute unanimity of sentiment as to the obligations of the association and the plan of action to be followed in opposing the demands of the molders' union. Emphatic denials were made of the erroneous reports published previous to the meeting that its purpose was to adopt ways and means of disrupting the molders' union. This association never advocated nor has ever been committed to the policy of extermination, and this special session was held solely to discuss the question of defense and the support to be given the members whose shops are now idle on account of the strike. From the time of its inception this organization has favored arbitration with the molders whenever possible on all questions such as wages and hours, a spirit which has not been shown on any occasions by the union officials. For six years the National Founders' Association, through committees composed of representative manufacturers affiliated with it, has endeavored to secure an agreement with the molders' union that would be equitable to all parties concerned. For four years the standing committee met this union frequently for the purpose of accomplishing this end, the last meeting having been held in April, 1904, and was attended by about 30 officers and business agents of the union and eight members of the association, and nearly a week was devoted to an effort to arrive at a satisfactory agreement. At the expiration of this meeting the union's officials held to the same position with regard to the strict enforcement of its regulations to which it held prior to the organization of the National Founders' Association.

The effects of the present strike are more far-reaching than any that has yet been declared by the molders, as it includes shops in Kansas City, Springfield, Mo., Minneapolis, St. Paul, Chicago, Milwaukee, Boston, Scranton, Pa., and Cleveland. It is estimated that 7000 molders are involved, but as yet no compilation has been made of the foundries that are idle. While the demands in the various sections of the country with respect to shorter hours and wages differ to some extent, they are universally coupled with the demand for closed shop signed agreements. These demands were presented in shops em-

ploying molders and coremakers to the number of at least 20,000 during the past two weeks, but the union has not met with as much success in closing the shops where signed agreements were refused as anticipated, and it is understood that an effort is being made to limit the strike to the foundries that are now idle.

A meeting of the members of the National Founders' Association in the Chicago district was held on Monday, May 14, and a Chicago branch of the National Founders' Association was organized. Twenty foundries at which strikes were declared pledged their membership and decided to hold out against the molders' demands. Only one of these foundries is shut down entirely, all of the others taking off daily heats with the aid of helpers, handy men and such nonunion men as could be secured. In Milwaukee the founders are also making favorable progress, and while their operations are hampered and the output is curtailed, only a few of the 24 struck shops are in idleness.

Statement of the Iron Molders' Union.

The May number of the *Iron Molders' Journal* devotes much space to the meeting of the National Executive Board of the Iron Molders' Union, held at Cincinnati, and the tone of the article dealing with the issues raised on May 1 at various foundry centers indicates that the officers of the Iron Molders' Union believe that a crucial struggle is on for the maintenance of the position of the union. The Executive Board was in session nine days, beginning April 9, and 121 grievances were presented for consideration. In a circular issued on April 21 President Valentine says that these grievances were all in the nature of demands for increases in wages and for shorter hours. "A state of warfare has existed for the past two years," the president continued, "and we have been forced to act on the defense against unjust demands for reductions of wages and the open shop." To meet the situation it was decided, after conference with the business agents of the union, to levy an assessment of 10 cents a week on the entire membership, commencing with May 5, 1906, and continuing until otherwise ordered.

In an editorial headed, "The Issue," the *Iron Molders' Journal* says that the National Founders' Association has raised an issue which must determine the future action of the Iron Molders' Union. The article then refers to the main features of the National Founders' Association "Outline of Policy," including the following propositions, in substance: That molders shall work under piece work, contract or premium system, as the foundrymen may desire; that members of the Iron Molders' Union shall work peaceably and harmoniously with nonunion molders; that the foundryman shall determine the number of his apprentices, also the conditions under which molding machines shall be operated. The editorial then refers to the working out of this policy by the National Founders' Association in the past 18 months and concludes as follows:

The question before us is, shall we surrender the conditions secured through years of endeavor and sacrifice, and the principle of equal rights for foundrymen and molders alike, to this body of foundrymen, or shall we present a united front and stand determined not only to retain the conditions we have already secured, but forge ahead and still further improve the conditions under which many molders are forced to work?

Our answer has already been given. We are willing at all times to adopt the methods of conciliation and open-handed dealing in adjusting the questions which may arise. We are willing at all times to meet our employers half way in securing an adjustment of the diverging claims which may be made. We are willing at all times to grant the same privileges to our employers which we hold for ourselves. But we will not surrender our principles, the conditions we have secured, and our organization, to any group of foundrymen who hold as a cardinal principle that the questions which vitally affect the welfare of our members and the life of our organization are not and cannot be made subjects for conference or arbitration.

The summary of the quarterly reports of the officers of the union, as given by the *Iron Molders' Journal*, shows that 90,692 names are now enrolled on the union's membership cards; that 2037 persons were initiated in the first quarter of 1906, and 1781 members reinstated. The treasurer's receipts for the quarter amounted to \$93,552.68 and the amount paid in sick benefits during the quarter was \$47,475.75.

The National Association of Manufacturers.

The eleventh annual convention of the National Association of Manufacturers opened Monday, May 14, in the Waldorf-Astoria, New York, with a good attendance. President David M. Parry appointed the following committees:

RESOLUTIONS.—J. W. Van Cleave, Missouri; Chas. T. Lee, Illinois; O. O. Ozlas, Ohio; W. M. Pratt, Massachusetts; F. C. Nunemaker, Kentucky; S. B. Chase, New York; Richard Young, New York; H. S. Chamberlain, Tennessee; W. H. Parlin, Illinois; W. M. Lowney, Massachusetts; W. H. Sipe, New York; W. H. Williams, Michigan; A. B. Farquhar, Pennsylvania; Geo. H. Barbour, Michigan; Griffith C. Little, Ohio; Howard K. James, Indiana, and Samuel T. Brush, Illinois.

CREDENTIALS.—E. F. Hartshorn, New Jersey; B. F. McFadden, New York; W. J. Blakeney, Ohio; Nathan Mayer, Illinois; L. M. Byles, Illinois, and A. B. Blakeley, Louisiana.

RULES AND ORDER.—Wm. McCarroll, New York; C. B. Woodruff, California; C. H. Smith, Illinois; I. H. Page, Massachusetts, and J. D. Massey, Georgia.

Following are extracts from Mr. Parry's presidential address, which dealt largely with the labor problem, Government control of corporations and rate legislation:

"No association ever chose a more useful field of effort than that chosen by the National Association of Manufacturers. Only a few years ago trades unionism unrestrained and militant was rapidly forcing the industries of the country to a closed shop basis. It was almost a crime to criticize the unions. But a change has come, and this association is largely responsible for it. The strike is no longer popular. When the unions propose to tie up an industry the press is now generally disposed to argue the question judicially and diplomatically. Disciples of the gospel of regenerating society through violence and murder are occasionally even sent to jail. What has brought about these changes? The question can be answered in one word—organization.

"The results achieved through organization in widely extending the open shop, in changing public opinion and in preventing iniquitous legislation during the past year are proofs of the power of organization. It should be our purpose to develop this work of organization to the fullest possible degree. Much has been done already, but much yet remains to be done.

"Industrial buccaneering cannot be permitted either by labor unions or by corporations. The members of organized labor and the corporations are entitled to their legitimate earnings and no more. The efforts of some of those in control of corporations to secure profits which neither they nor the corporations have justly earned have given rise to the demand for government control of corporations, but government control of corporations, when it means arbitrary limitation of profits legitimately earned, simply spells socialism, and as a remedy for existing evils should be execrated even more than the evils themselves. The government has no more right to interfere with the property rights inherent in individual liberty than has a union or corporation. Its sphere of duty is that of protecting public rights and not that of aggressing upon them. It is not government management of capital that is needed, but government prevention of industrial buccaneering of all kinds.

"The country has witnessed during the past year a very remarkable discussion on the subject of rate legislation. The principal point at issue is that of government fixation of rates. The rebate evil plays no important part in the controversy, because it could exist as readily under a system of government rate making as under the present system, and because, further, there is no difference of opinion regarding it, the entire country being practically unanimous on the proposition that the evil of favoring some shippers to the injury of competing shippers should be summarily dealt with by the government. It is interesting to note that a number of rebate cases have been successfully prosecuted in recent months, thus tending to show that there is nothing particularly the matter with the present law, although it seems something might be said regarding its nonenforcement. There is not only no controversy over the question of stamping out the rebate evil, and that by drastic enactments if need be, but also

there is no controversy over the proposition that the railroads must be made to live up to their common law obligation not to charge unreasonable or discriminating rates of any kind."

Mr. Parry defended the United States Senate and the judiciary and attacked the various eight-hour and anti-injunction measures which have been introduced in Congress. His address was punctuated with frequent applause and called out a standing vote of thanks, which in turn drew from him an acknowledgment of the compliment and the statement that he would not under any circumstances accept renomination for the presidential office.

Tuesday's session was occupied largely by the reading and consideration of committees' reports. The Committee on Resolutions reported the following, which was unanimously adopted:

Whereas, The Federal and State laws to prevent arbitrary, tyrannous and harmful acts of combinations in restraint of trade are in the interest of the whole people; and

Whereas, The operations of various combinations have been notoriously contrary to law in conspiring to injure trade, both State and interstate, and in prevent the free operation of industries; and

Whereas, These conspiracies have been most tyrannous and oppressive, and have robbed citizens of their constitutional rights and liberties; therefore, be it

Resolved, That the members of this association, through its officers, make demand upon the proper authorities to prosecute the officers and members of all combinations of capital and labor whenever their acts contravene the law.

Other resolutions recommended and adopted were in effect as follows: That the National Association of Manufacturers recommends and urges upon Congress immediate passage of the Marine Commission's shipping bill, as passed by the Senate; that the association recommends the organization of citizens, under the National Citizens' Industrial Association, in order that they may meet combinations, both of capital and labor, with superior organization that will control community affairs in the interests of the majority of citizens; that the National Association earnestly requests that as far as practicable American materials be used in the construction and equipment of the Panama Canal.

The Committee on Tariff and Reciprocity urged that all members of the association bring their personal influence to bear wherever and whenever practicable with members of Congress and persons influential in the Administration to promote the principles of reciprocity, especially with respect to trade between the United States and Canada.

The Committee on Interstate Commerce made a report dealing with rate bill legislation, suggesting that carriers be compelled to keep their books in a specified way, with the right upon the part of the Government to examine those books without notice at any time, and thus check the payment of rebates; also that any legislation should secure to the carrier the right to try the question of a rate made by the commission, claiming that no legislation which fails in this respect can be constitutional.

The Committee on Industrial Education commended the establishment of trade schools, stating that the private trade schools teaching one or two trades should be encouraged, unless their owners become too avaricious and work more for their own financial gain than for the good of the boy.

J. W. Van Cleave of the Buck's Stove & Range Company, St. Louis, was elected president at the Wednesday morning session, and F. H. Stillman of the Watson-Stillman Company, New York, was made treasurer.

The convention is still in session at the time of going to press.

A recent inspection was made by the city officials of Cleveland, Ohio, of the private fire department at the Newburgh mills of the American Steel & Wire Company. The 140 volunteer firemen at these works were found to be as efficient as the city firemen and the extinguishing apparatus up to the standard. The mills are equipped with 28 private alarms and an equal number of city alarms. The territory covered is 14 acres. A similar fire department is organized at each of the 28 plants of this company.

NEWS OF THE WORKS.

Iron and Steel.

The Ashland Iron & Mining Company, Ashland, Ky., is rebuilding its No. 2 blast furnace and putting on an additional 10 feet, as well as rebuilding the stoves and making them 14 feet higher. The contract for this work has been let to D. Lamond & Son, Pittsburgh, Pa., who will change the stoves to the C. H. Foote type, with all the latest improvements. Some new machinery has been installed in the company's cement mill, materially increasing its capacity, and it is expected to shortly put the mill on double turn. Contract has recently been closed for 17,000 barrels of cement to be used in the street improvement work in Ashland, Ky., and other orders booked will keep the mill running to fullest capacity for the balance of the season.

The Norton Iron Works, Ashland, Ky., expects to blow in its rebuilt furnace at Ashland in May. It has been idle for over a year and was last operated by the Ashland Iron & Mining Company under lease. Bessemer pig iron will be made, for which the furnace has an annual capacity of 82,000 tons.

Early in July the Dominion Iron & Steel Company will commence the erection of two 15-gross-ton acid Bessemer converters at its works at Sydney, Cape Breton, Nova Scotia. The company expects to have the converters completed early in 1907. They will be used as accessories to its open hearth department.

The works of the Ohio Valley Steel & Foundry Company, at Paden City, W. Va., were sold at public auction on April 23, and were purchased by R. A. Carter of Pittsburgh. The sale was subsequently confirmed by the court.

A blast furnace will probably be built at Hamilton, Ohio, in the near future. E. L. Phillips of Hamilton is interested in the project.

The rolling mill and wrought iron pipe works at Helena, Ala., formerly operated by the Alabama Tube & Iron Company, have been purchased by E. H. Thornton, president of the Neal Bank, Atlanta, Ga. The works have been idle for a long time. The rolling mill is equipped for the manufacture of muck bar, skelp and merchant bars. The pipe department has an annual capacity of about 15,000 tons of $\frac{1}{4}$ to 2 inch pipe. The works are for sale. Communications concerning them should be addressed to Brown Brothers & Co., Birmingham.

The rolling mill of the Iron & Steel Company of Canada, at Belleville, Ontario, which was idle during the whole of 1905, has been sold to J. W. Wardrope, Ottawa, Canada. The plant has an annual capacity of about 12,000 tons of bar iron and steel. It is also equipped for the production of cut nails, horse-shoes, ship and railway spikes, track bolts, washers, &c. Its spike factory has an annual capacity of about 50,000 kegs.

The North American Steel Company has acquired the rolling mill at Belington, W. Va., the construction of which was commenced in October, 1904. The works, which are equipped for the manufacture of iron and steel sheets, for which they have an annual capacity of about 10,000 tons, are shortly to be started. David A. Nease is president; Grant C. Broomall, vice-president; S. M. Nease, secretary, and Henry Koehler, Jr., treasurer.

J. F. Batchelder, Portland, Ore., and others are preparing to put in operation on the Pacific Coast large commercial concentrating plants to separate the iron and other minerals from the black sands of the Pacific Slope, with the ultimate intention of establishing a steel plant. This action follows a series of investigations conducted by Dr. David T. Day of the United States Geological Survey, and Mr. Batchelder. The first plant, now under construction, will consist of a placer mining dredge to handle the black sands, with the necessary magnetic separators and concentration tables to produce the magnetic iron. This plan will be located in the Columbia River basin, and will, it is stated, be followed by other concentrating plants and the electric smelting plant. The dredge is of the bucket elevator type, having a daily capacity of 2000 cubic yards, and is being built by the Hammond Mfg. Company, Portland, Ore. The magnetic separators are being built by the Black Sand & Gold Recovery Company, Chicago, and are of the Lovett type, having a capacity of 100 tons of sand per day for each machine. The balance of the equipment has not been purchased. Mr. Batchelder, who is now in Chicago for the purpose of purchasing machinery, is located at 1511 Marquette Building.

It is announced that Milton E. Coombs, formerly district manager of the hoop mills of the Carnegie Steel Company in the Youngstown, Ohio, district, and who recently resigned, will erect a continuous steel hoop mill of modern type at Niles, Ohio. Mr. Coombs is now trying to interest Niles capital in the new mill, and if successful work on the plant is expected to be started within a short time.

The formal transfer of the stock of the Empire Iron & Steel Company, which was sold recently to new parties, and whose sheet mill plant is located at Niles, Ohio, was made last week. The new company will also be known as the Empire Iron & Steel Company and has elected the following officials: John Warner, president; W. T. Hardesty, vice-president; Jacob Waddell, secretary and treasurer. The organization of the sheet metal company, which will continue to be operated under a separate management, is incomplete, but Dwight Strickland will

be president and John F. O'Dea secretary and treasurer. The entire plant is now in full operation turning out black and galvanized sheets. The company contemplates adding tin mills and possibly mills for rolling hoops and bands as well.

The 20 hot mills in the works of the American Sheet & Tin Plate Company at Sharon, Pa., have been closed down, lack of tin bars being given as the reason. The tinning department is in operation, as there is enough black plate on hand to run the tinning stacks for some little time.

The financial affairs of the Continental Iron Company, whose plant was located at Wheatland, Pa., and which failed several years ago, show that the creditors will realize comparatively a small amount on their claims. The final rating of liabilities has been placed at \$343,393.88, with assets amounting to \$66,192.27. Referee in Bankruptcy L. F. Hunter is now making out papers for a 12 per cent. dividend in favor of the creditors. An additional dividend will later be declared on a fund amounting to \$26,000.

It is expected that the new furnace the Northwestern Iron Company is building at Mayville, Wis., will be completed by December 1, 1906. The capacity of the two furnaces of the company will then be about 600 tons a day. The outlay for the new work is expected to be about \$550,000. Julian Kennedy of Pittsburgh is consulting engineer.

General Machinery.

The Wyland-Newman Machine Company, Greensboro, N. C., has incorporated, with a capital stock of \$100,000, to manufacture and deal in iron and wood working machinery and supplies, castings, forgings, &c. The company will erect a plant at Railroad and Jackson streets, which will consist of a main building, 150 x 200 feet, two stories; foundry, boiler house, wareroom, &c. It is expected that the company will be ready for business in about 90 days. George C. Wyland is president and general manager; O. C. Wysong, vice-president, and George F. Newman, secretary and treasurer.

The metal working machinery business of Henry J. Ruesch, Newark, N. J., has been incorporated under the name of the H. J. Ruesch Machine Company.

The Foster Machine Company, Westfield, Mass., manufacturer of special textile machinery, is to build an addition to its plant 60 x 120 feet and one story. Arrangements have been made for the purchase of the machinery.

The Larsen-Baker Ice Machine Company, Omaha, Neb., has just completed some very extensive improvements at its plant which have materially increased the capacity. Orders are stated to be coming in in such volume that still further extensions will be necessary. The company increased its capital stock from \$150,000 to \$250,000, for the purpose of making these improvements and buying the necessary equipment.

New forge shop equipments are being installed this summer by numerous large manufacturers, and similar equipment for the manual training schools will be set up during the vacation season so as to be in readiness in the fall. The Buffalo Forge Company, Buffalo, N. Y., as usual, has its factory well filled with these orders. Among the most recent are large equipments for the Midvale Steel Company, Lynn works of the General Electric Company, Calumet High and Manual Training School, Calumet, Mich., and the Indiana Reformatory, Jeffersonville, Ind.

W. W. Briggs, district manager for the San Francisco office of the Westinghouse Electric & Mfg. Company, was in Pittsburgh last week in conference with the executive officials of that company regarding plans for new quarters in San Francisco. The company had storerooms at First and Market streets, which were totally destroyed by the earthquake and fire, together with electrical supplies valued at \$225,000. The Westinghouse Company has about 40 carloads of machinery on the way to the Pacific Coast, and it is expected that this week further large shipments will be started. The company has erected a temporary building, which will serve its requirements until a better structure can be completed.

The Bates Machine Company, New York, is largely increasing the facilities of its plant in Brooklyn.

The United Iron Works Company, Springfield, Mo., which operates several plants in different States, contemplates the erection of a new machine shop, 150 x 200 feet, at Springfield. The new shop is to be equipped with an electric crane and other modern machinery. At this plant boilers, engines, coal mining and ice and refrigerating machinery are manufactured.

The Concrete Hydraulic Machine Company has been incorporated at North Tonawanda, N. Y., to engage in the manufacture of hydraulic presses and other machinery for making concrete building blocks, &c. The capital stock is \$50,000. The incorporators are: J. S. Thompson and G. F. Fisher, North Tonawanda; E. H. Hubman, Tonawanda, and W. W. Wade, Buffalo, N. Y.

The Columbus Die Tool & Machine Company, Columbus, Ohio, has been incorporated with \$10,000 capital stock by G. R. Lucas, C. E. Westervelt, George W. Syler, S. S. Ford and H. H. Price. The company will manufacture dies and tools.

The Cleveland Electric Railway Company is improving its repair shops and has recently installed a number of new tools,

including a 24-inch Cincinnati lathe, 24-inch Hamilton drill press, Yankee drill grinder and a four-cylinder Fay & Egan wood planer.

Power Plant Equipment.

Among some recent orders which the E. Keeler Company, Williamsport, Pa., has secured for its water tube boilers are 1000 horse-power for the State Hospital for the Insane, Danville, Pa.; also a large self supporting steel stack and breeching to be used in connection with these boilers. The company is also building 1500 horse-power of water tube boilers for the Windsor, Essex & Lake Shore Rapid Railway Company, Kingsville, Ontario, and 7 x 150 foot self supporting steel stack and large steel breeching in connection with this, as well as all the pipe work and other construction; one thousand horse-power of water tube boilers for the Boyd Equipment Company, New York. These latter boilers will be placed in the Howard Carroll Building on West street, near Cedar street, this being one of the largest buildings that has been put up in New York.

The Canadian Westinghouse Company, Limited, is supplying the Provincial Light, Heat & Power Company with apparatus to be used in the development of another large water power plant near Montreal. The initial installation will consist of three 3750-kw. alternating current generators and 12 2500-kw. transformers. This new station will be used for supplying additional power to the Montreal Light, Heat & Power Company. The transmission line is about 40 miles in length.

The Francis Cotton Mills has recently adopted Westinghouse-Parsons turbines for its power plant at Blasco, N. C. This plant adds one more to the now long list of cotton mills using steam turbine power.

The Power & Mining Machinery Company, Milwaukee, Wis., has recently received contracts for Loomis-Pettibone gas generating plants for an aggregate of approximately 12,000 horse-power. These include the following installations: Pittsburgh Plate Glass Company for its Crystal City, Mo., plant; Norton Emery Wheel Company, Worcester, Mass.; Charlotte Consolidated Construction Company, Charlotte, N. C.; Sayles Bleacheries, Saylesville, R. I. These producers will be operated on bituminous coal.

The Pfannmueller Engineering Company, Chicago, has recently received contracts from a brick company in Kansas for a 500 horse-power Corliss engine, 500 horse-power boilers, pumps and appurtenances; from a company in Pittsburgh for two 350 horse-power Westinghouse compound engines; from a brick plant near Chicago for furnishing complete power equipment. The demand for power plant equipments is reported unusually good.

The Chicago & Milwaukee Electric Railway has incorporated the Chicago & Milwaukee Power Company, to build and operate the new power plant to be erected at Waukegan, Ill. A. L. Drum, who has been general manager of the railroad company, has resigned that position to become superintendent of the erection of the new plant.

The De La Vergne Machine Company, New York, recently closed the following contracts for Hornsby-Akroyd oil engines: Windsor Locks Water Company, Windsor Locks, Conn., 50 horse-power for pumping station; John McKesson, Chappaqua, N. Y., 9 horse-power; Bergstrom & Bass, Brooklyn, N. Y., 20 horse-power; S. Oppenheimer & Co., New York, 25 horse-power; Freeman, Daughaday & Co., Charley, Mass., 50 horse-power; township of West Lebanon, Lebanon County, Pa., 44 horse-power for pumping station; Borst & Rockstroh, Middleburg, N. Y., 7 horse-power; John Pirkl Iron Works, Brooklyn, N. Y., 50 horse-power; John W. Sullivan, New York, 75 horse-power; Dr. F. A. C. Perrine, New York, 7 horse-power; Houston Ice & Brewing Company, Houston, Texas, 16 horse-power engine to drive a De La Vergne ice machine.

The Odium-Taylor Boiler Company, Memphis, Tenn., organized and incorporated under the State laws of Tennessee in September last, has purchased 5 acres of ground in North Memphis, on which it is erecting new works. The main building is 128 x 300 feet, of steel construction. It is fitted with travelling cranes and full hydraulic and pneumatic equipment, including riveters and flange presses. The entire plant is motor driven and is said to be one of the first to adopt alternating current throughout, generator and 22 motors being installed. Span of crane is 50 feet and height 40 feet. The shop is located on main lines of Illinois Central and Missouri Pacific Belt tracks. Leading lines of manufacture will be the highest class of horizontal tubular boilers, tanks, towers, &c., while particular attention will be given to heavy special plate work demanded by furnace and mining trade, a department in which Mr. Blume, manager of the works, is recognized as one of the ablest men in the country. It is expected the works will be finished and operating early in June.

The City Council of Alliance, Ohio, has arranged to sell bonds to the amount of \$9200 for the purpose of purchasing additional equipment for the municipal water works plant. Plans and specifications for the improvements are on file with the Department of Public Service of that city.

The Riggs & Sherman Company, Toledo, Ohio, consulting engineer, has submitted plans to the Board of Public Service of Fremont, Ohio, for the rebuilding of its water works system. It recommends the purchase of a high pressure pump and the

erection of a new stand pipe, the old one being declared unsafe. The recommendations call for an expenditure of about \$35,000.

The Standard Boiler & Plate Company, Niles, Ohio, is erecting a new plant, which it expects to have in operation about the middle of June. Machinery is being moved from Marietta, Ohio, where the business was formerly located, and considerable additional machinery will also be installed.

The Board of Public Works of Cleveland has awarded a contract to the Allis-Chalmers Company, Milwaukee, for furnishing a 500-kw. turbine engine and generator for the South Brooklyn lighting station, which the city has recently acquired and which will illuminate the south side of the city. Contracts for boilers and other steam equipment are soon to be closed.

Foundries.

The Otis Elevator Company, Chicago, is making a one-story addition to its foundry, which will be 84 x 123 feet. Sufficient equipment is already provided for this extension.

The J. A. & P. E. Dutcher Company, Milwaukee, Wis., is about to add one 10-gross-ton acid open hearth steel furnace to its plant. The new furnace will probably be completed and ready for operation in June. When the new open hearth furnace is completed the works will have an annual capacity of about 3500 tons of open hearth and 75 tons of crucible steel castings for bicycle, machinery and electrical use.

The Continental Stove Company, Richmond, Va., has installed a Newton patent cupola of 14 tons hourly capacity, supplied by the Northern Engineering Works, Detroit, Mich.

Work on the construction of the new plumbers' enamel ware plant of the McCrum-Howell Company, Uniontown, Pa., is going forward steadily. The buildings are being constructed of brick, with concrete foundations, covered with a slag fireproof roof. There are 7 or 8 acres of large buildings, the foundry alone being 352 feet long. The equipment will be modern in every respect, much improved machinery being installed. The company expects to start the new plant in June and will run it to its full capacity, as fast as the men can become accustomed to the work in the new buildings. The daily output will be 300 finished bathtubs and 300 pieces of small ware, such as lavatories and sinks. There is a great demand for enamel ware, and the company is putting forth every effort to get the plant started so that it can supply its customers. F. D. Cook, who was in charge of the plant at Blairsville, Pa., will have charge of the new plant at Uniontown. Andrew J. Holfelder will be the foundry foreman. The radiator plant of the McCrum-Howell Company is being operated steadily, turning out over two carloads of finished product, or nearly 1100 feet of radiation, per day.

A charter has been granted to the West Steel Castings Company, Cleveland. The incorporators are: Ralph H. West, Samuel H. Beck, C. A. McKinley, Harry A. Williams and E. H. Penning, all of Cleveland. It is stated that the company has not yet decided where it will locate, but will do so in the near future. It will manufacture basic open hearth steel castings.

Fires.

The Glassport plant of the Severance Mfg. Company, Pittsburgh, Pa., was destroyed by fire May 10. The loss amounts to about \$60,000.

The electric plant of the Anderson Water, Light & Power Company, Anderson, S. C., was burned May 11, entailing a loss of about \$100,000.

The machine shop of the D. Grieme Coal Company, Fiftieth street and Twelfth avenue, New York, was burned May 14.

The novelty works of James Kerr at Clearfield, Pa., was burned last week. The loss is about \$30,000.

The spring department of the Higgins Spring & Axle Company, at Racine Junction, Wis., was burned May 14. The loss is about \$30,000.

The piano factory of Jacob Doll & Sons, New York, was destroyed by fire May 15. The loss is placed at \$100,000.

Hardware.

The Anderson Tool Company, Anderson, Ind., has recently reorganized, with the following officers: J. A. Van Osdal, president; B. D. Emanuel, secretary, and H. G. Wilcox, treasurer. The company has built a large addition to its plant, with a view to keeping abreast of the increasing demand for its products, comprising computing cheese cutters, computing scales, computing tanks, computing scoops, gas and gasoline engines, butter cutting and forming machines, electrically driven universal grinders, slot machines, &c.

The Munro-Eastwood Pen Company, New Britain, Conn., has been incorporated in Connecticut, with capital stock of \$50,000, to manufacture steel pens. The incorporators are John W. Eastwood and M. A. Eastwood, Plainville, Conn., and William Munro and E. Munro, New Britain. The business was established last September as a partnership.

The Chapin-Stephens Company, Pine Meadow, Conn., manufacturer of rules, planes, levels, gauges, &c., is to make extensive improvements to its plants this season. A water power acquired some two years ago with the Chapin machine shop property will be developed and a new turbine water wheel in-

stalled. The Chapin Building, a two-story structure, 36 x 180 feet, has been renovated. The company's level department has been crowded for some time and the new building will afford the additional necessary floor space. The space made vacant by the removal of the level department will be devoted to the drying of timber for making wood planes, this branch of the business having revived and the demand exceeding anything the company has had for the past 20 years.

The American Axe & Tool Company is to make extensive additions to its works at East Douglas, Mass. A new machine shop will be 40 x 80 feet and two stories a tempering room 30 x 32 feet and a third building 32 x 74 feet and two stories.

The Blank Mfg. Company, Quincy, Ill., has been incorporated by Charles A. Blank, Homer M. Swope and Henry C. Wiethaupt. The company will manufacture galvanized steel chain pumps and tubing and all kinds of sheet metal specialties in copper, brass, tin, &c.

The Montana Anchor Fence Company, Helena, Mont., is now installed in its new quarters and is prepared to manufacture wire fencing, and, in fact, all kinds of wire goods, office fixtures, &c., on a more extensive scale than previously. A complete galvanizing plant is being installed and the company will shortly be in shape to do all kinds of galvanizing work. The company controls the patent on Anchor fencing and gates for the State of Montana, and reports a large business received from ranchers and stockmen. Officers of the company are John M. Boardman, president; C. W. Dresser, vice-president; M. S. Gunn, secretary, and Clyde G. Smith, treasurer and manager.

Miscellaneous.

F. L. & J. C. Codman, Boston, Mass., manufacturers of cotton buff wheels, have built a factory at Windsor, Canada, from which their foreign business will be done. The new plant will be under the direction of John C. Codman.

The plant of the Michigan Pipe Company, Bay City, Mich., which was recently destroyed by fire, is being rebuilt and will be placed in operation again about the first of June. The loss to the old plant aggregated \$50,000, on which there was an insurance of \$24,500. About \$5200 out of \$13,000 worth of stock in the yard was destroyed. The fire came at a very inopportune time, as this is the company's busiest season.

The Confectioners' Machinery & Mfg. Company, Springfield, Mass., is to add a fourth story to its building. A part of the new space will be devoted to a copper shop. No equipment will be required.

The Keystone Wire Matting Company, Beaver Falls, Pa., will build a three-story addition to its plant, 32 x 48 feet. The company contemplates the installation of a gas engine for lighting purposes and a 6-inch pipe machine. The other machinery which is being added to the plant has been purchased.

The recently organized Michigan Copper & Brass Company, Detroit, Mich., has started work on the erection of its plant, which will consist of a main building 180 x 557 feet. The company has not yet decided upon what machinery it will purchase for equipping the plant.

The Canadian Bronze Company, Montreal, one of the Canadian branches of the Magnus Metal Company, has let contracts for a large addition to its plant, which will double its present capacity. Fifteen furnaces will be added.

PERSONAL.

At the May meeting of the Iron and Steel Institute the Bessemer gold medal for 1906 was presented to Floris Osmond of Paris, France.

Sydney Jessop Robinson of Sheffield, England, who bears the ancient title of master cutler, on May 12 personally presented to President Roosevelt a history of the cutlery industry, of which he is the author.

S. T. Wellman of the Wellman-Seaver-Morgan Company will sail shortly for Japan.

Wm. P. Harper has been placed in charge of the new department of purchases and stores of the Allis-Chalmers Company, Milwaukee. Mr. Harper was formerly connected with the Edward P. Allis Company and for a number of years with the Wm. Bayley & Sons Company.

Wm. G. Mather, president of the Cleveland-Cliffs Iron Company, addressed the Senate Committee on Finance at Washington last week in opposition to the bill removing the duty from denatured alcohol. Mr. Mather spoke from the standpoint of the manufacturers of wood alcohol.

Arthur J. Vance, superintendent of the Southern Engine & Boiler Works, Jackson, Tenn., will assume charge of the Buffalo Forge Company's interests in the Cincinnati

district June 15. Mr. Vance was formerly Cleveland manager for the Buffalo Forge Company, but was compelled to resign that position on account of illness, due to the climate, from which he has fully recovered since his location in the South.

Ralph B. Hayward, manager of the Pittsburgh office of the B. F. Sturtevant Company, has resigned this position to accept the management of the Chicago branch store of the Buffalo Forge Company, with which company he began his career in the fan business. The Chicago location is 54 to 60 South Canal street. Mr. Hayward enters upon his new duties June 1.

OBITUARY.

SIR DAVID DALE.

The announcement comes from England that Sir David Dale died of heart disease at York April 28. Born at Moorsheadabad, Bengal, December 11, 1829, the son of an official of the East India Company, he settled early in life at Darlington. As a comparatively young man he took a lease of the Shelton Iron Works, and in 1864 became one of the directors of the Cousett Iron Company, a connection which he retained to his death. He was also a partner in the famous coal and coke producing firm of Joseph Pease & Co., and was interested in the development of the Dunderland mines in Sweden. Sir David Dale was the originator in 1868 and for many years the head of the Board of Arbitration and Conciliation for the Manufactured Iron and Steel Trade of the North of England and of the Board of Conciliation for the County Durham Coal Trade. These organizations were based on sliding scales. He was one of the founders of and was deeply interested in the Iron and Steel Institute. He was treasurer from the start, until in 1895 he was elected president. During his whole career he was one of the leading men in the English iron trade.

JAMES LELAND HOWARD, president of the James L. Howard & Co., corporation, and a former lieutenant-governor of Connecticut, died at Hartford, May 1, aged 88 years. He was born in Windsor Vt., January 19, 1818. He went to Hartford when he was 20 years old and in 1841 formed a partnership with Edmund Hurlburt for the manufacture of saddlery hardware. He later bought out his partner, and with his brother formed the firm of James L. Howard & Co. They were among the first to go into the manufacture of railroad car furnishings. He leaves a widow and three children.

JOHN W. HARTNESS, who was in charge of one of the operating departments of the Otis Steel Company, at Cleveland, Ohio, for a number of years, died on May 11 at Springfield, Vt., at the home of his son, James Hartness, president of the Jones & Lamson Machine Company.

JOHN N. LAUTH, brother of B. C. Lauth and manager of the Tula Iron Company, at Tula, in the State of Jalisco, Mexico, died at Guadalajara, Mexico, April 4. He was born at Pittsburgh, December 14, 1842, his father being Bernard Lauth, who was for many years prominent in the American iron trade. Before going to Mexico Mr. Lauth was connected with the Helmbacher Forge & Iron Company, St. Louis. He leaves a widow, but no children.

GUSTAV FUCHS, founder and head of the Gustav Fuchs Iron Works, at the foot of East 104th street, New York City, died at his home in Brooklyn, May 12. He was 54 years old and had been in the foundry business for 25 years. His widow, three sons and a daughter survive him.

THOMAS L. HIGGINS died at his home in Brooklyn May 12. He was born in Ireland, and for many years was the proprietor of the Watt Iron Works in New York City, afterward moving the business to Brooklyn. During the Civil War Mr. Higgins was chief engineer of a transport, and aided in cutting the chain blockade across the Mississippi River. He retired from business several years ago. His widow, six sons and four daughters survive him.

The Iron and Metal Trades

The most striking news of the week is that coming from Chicago relating to Steel Rails for 1907. It is stated that the total new tonnage for 1907 thus far booked foots up to 562,000 tons, this including contracts placed by the Great Northern, Northern Pacific, St. Paul, Burlington, Illinois Central and Wisconsin Central. It is estimated that the Illinois Steel Company will have to carry over from this year to next about 80,000 tons. The pressure on this mill, which was so heavy during all of this year, will therefore continue in 1907, and it is understood that the Pueblo mill is also heavily booked. It is stated that the Illinois Steel Company was not able to take its allotment of the Pennsylvania tonnage, the Carnegie mills taking it all. Among the additional orders for 1907 placed during the week is the Wabash with 10,000 tons.

A very fair amount of business was also placed with the Rail mills for delivery during the current year. This includes 15,000 tons additional for the Chesapeake & Ohio, 6200 tons for a Louisiana road, 6000 tons for the Oneida Railroad and 5000 tons for the Nickel Plate.

A widespread struggle, which may have its serious influence upon the consumption of Pig Iron, is that between the founders and molders in Chicago, Milwaukee, St. Paul, Cleveland, Buffalo, Scranton and Boston. There may be further additions to this somewhat formidable list. Pittsburgh may be involved, demands having been made.

There has been some fair buying of Foundry Iron at lake points, in New England and in the Philadelphia and New York districts. But in the Central West what little business has come up has been taken away from Southern furnaces, who have for some time been apparently indifferent to sales. The leading interests have maintained their agreement to hold for the basis of \$14 at Birmingham for No. 2.

The market for steel making Irons is practically swept clean up to the middle of the year, with an unsatisfied demand. In the East some sales of round lots of Basic have been effected and there are some good inquiries in the market. These include one lot of 10,000 tons and another of 10,000 to 15,000 tons.

Steel Billets are somewhat easier in the Central West and \$26 is now being done.

There is comparatively little new work coming up in the heavier lines, like Structural Material and Plates. The dissatisfaction of certain important groups of consumers of Bars continues and may lead to some concerted action on the part of the mills.

There is a heavy run of new business in the Merchant Pipe trade and the Sheet mills are firmer, the demand being very heavy. The enormous advance in Pig Tin, now selling close to 50 cents a pound, is a serious calamity to the Tin Plate industry, since it must cause an advance in prices and may restrict consumption.

The producers of Cast Iron Pipe are under an enormous unparalleled pressure from buyers of small lots for prompt delivery.

A Comparison of Prices.

Advances Over the Previous Month in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

	May 16, 1906.	May 9, 1906.	Apr. 18, 1906.	May 17, 1905.
PIG IRON , Per Gross Ton:				
Foundry No. 2 Standard, Philadelphia	\$18.50	\$18.50	\$18.50	\$17.25
Foundry No. 2 Southern, Cincinnati	16.75	16.75	16.75	15.75
Foundry No. 2 Local, Chicago ..	18.50	18.50	18.75	17.25
Bessemer, Pittsburgh	18.10	18.10	18.35	16.10
Gray Forge, Pittsburgh	16.50	16.50	16.85	15.60
Lake Superior Charcoal, Chicago ..	19.00	19.00	19.50	17.50

BILLETS, RAILS, &c., Per

Gross Ton:				
Bessemer Billets, Pittsburgh	26.00	27.00	27.00	23.00
Forging Billets, Pittsburgh	32.00	32.00	32.00	26.00
Open Hearth Billets, Phila.	29.00	29.00	29.00	27.00
Wire Rods, Pittsburgh	34.50	34.00	34.00	34.00
Steel Rails, Heavy, Eastern Mill ..	28.00	28.00	28.00	28.00

OLD MATERIAL, Per Gross Ton:

O. Steel Rails, Chicago	14.00	14.00	14.00	13.00
O. Steel Rails, Philadelphia	16.50	16.50	17.00	16.50
O. Iron Rails, Chicago	21.25	21.25	21.25	18.50
O. Iron Rails, Philadelphia	21.00	21.00	21.50	22.50
O. Car Wheels, Chicago	19.00	19.00	19.00	15.00
O. Car Wheels, Philadelphia	16.75	16.75	16.75	16.00
Heavy Steel Scrap, Pittsburgh ..	15.00	15.00	15.00	14.50
Heavy Steel Scrap, Chicago	13.50	13.50	13.50	12.50

FINISHED IRON AND STEEL,

Per Pound:	Cents.	Cents.	Cents.	Cents.
Refined Iron Bars, Philadelphia ..	1.63½	1.63½	1.63½	1.73½
Common Iron Bars, Chicago	1.66½	1.66½	1.66½	1.55
Common Iron Bars, Pittsburgh ..	1.50	1.50	1.55	1.55
Steel Bars, Tidewater, New York ..	1.64½	1.64½	1.64½	1.64½
Steel Bars, Pittsburgh	1.50	1.50	1.50	1.50
Tank Plates, Tidewater, New York ..	1.74½	1.74½	1.74½	1.74½
Tank Plates, Pittsburgh	1.60	1.60	1.60	1.60
Beams, Tidewater, New York	1.84½	1.84½	1.84½	1.74½
Beams, Pittsburgh	1.70	1.70	1.70	1.60
Angles, Tidewater, New York	1.84½	1.84½	1.84½	1.74½
Angles, Pittsburgh	1.70	1.70	1.70	1.60
Skelp, Grooved Steel, Pittsburgh ..	1.57½	1.57½	1.57½	1.50
Skelp, Sheared Steel, Pittsburgh ..	1.60	1.60	1.60	1.55

SHEETS, NAILS AND WIRE,

Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, No. 27, Pittsburgh	2.25	2.25	2.25	2.30
Wire Nails, Pittsburgh	1.85	1.85	1.85	1.80
Cut Nails, Pittsburgh	1.80	1.80	1.80	1.80
Barb Wire, Galv., Pittsburgh	2.30	2.30	2.30	2.30
METALS , Per Pound:	Cents.	Cents.	Cents.	Cents.
Copper, New York	18.75	18.62½	18.62½	15.00
Spelter, St. Louis	5.85	5.90	5.95	5.30
Lead, New York	6.00	5.87½	5.35	4.50
Lead, St. Louis	5.87½	5.72½	5.30	4.45
Tin, New York	49.00	43.50	38.85	30.00
Antimony, Hallett, New York	26.50	24.50	20.00	8.75
Nickel, New York	40.00	40.00	40.00	40.00
Tin Plate, Domestic, Bessemer, ..				
100 pounds, New York	\$3.79	\$3.79	\$3.79	\$3.74

Chicago.

FISHER BUILDING, May 16, 1906.—(By Telegraph.)

A remarkable record, unprecedented in the annals of the Iron and Steel trade, has been made by the Illinois Steel Company in the booking of Standard Rail tonnage for 1907 delivery. In less than three weeks after opening the order books for next year's requirements the entire tonnage of this Rail mill was sold to Western and Northwestern roads. The contracts placed total nearly 600,000 tons, and with the tonnage that will be carried over the total already assured for 1907 aggregates 650,000 tons. This year's output was sold last fall in less than two months, and at that time it was believed that that record would never again be approached. Among the large purchases of the week were 40,000 tons for the Illinois Central, 25,000 tons for the Chicago, Burlington & Quincy, and 25,000 tons for the Wisconsin Central, while the Chicago, Milwaukee & St. Paul increased its order to 130,000 tons. The allotment of the Pennsylvania Railroad tonnage was also made, but none was taken by Western mills. A large tonnage for roads throughout this section still remains unplaced and when booked will probably be transferred to the Carnegie Steel Company. The Colorado Fuel & Iron Company is also reported to have taken large contracts, and the Tennessee Coal, Iron & Railroad Company is practically out of the market for 1907. Accompanying all Rail orders are specifications for Splice Bars, which are unchanged in price for next year's shipments. The settlement of the Structural workers' strike has resulted in a resumption of work on all downtown structures and the threatened tie-up of the building trades has been averted. The Pig Iron market is quiet, the molders' strike engaging the attention of consumers. Numerous large inquiries are still under consideration, but will undoubtedly

be held up until the labor situation clears. The Sheet demand continues unusually heavy, and higher prices for Tin Plate are anticipated on account of the recent sensational advances in Tin. Steel Bar specifications, while still heavy, have fallen off in volume and the mills are making fairly prompt deliveries. Shape requirements are crowding mill capacities and fitters cannot promise shipments in less than four months.

Pig Iron.—Notwithstanding the numerous inquiries for Malleable Bessemer and Charcoal Iron, there is little buying, consumers evidently not being interested in further purchases while the molders' strike is pending. Producers, especially in the South, are maintaining prices on a firm basis, and shading is limited to concessions of 25 cents a ton. The tremendous Steel melt has resulted in turning furnaces on Bessemer and Basic grades in the Mahoning and Shenango valleys, Virginia and Alabama, and the production of Foundry grades will consequently be curtailed to some extent. Ohio River furnaces are still quoting Malleable Bessemer at \$18.30, Chicago, and practically the same basis is maintained on Foundry grades from this district. Local furnaces are well sold up through July and are not pressing for business. Prevailing quotations, f.o.b. Chicago, are as follows:

Lake Superior Charcoal.....	\$19.00 to \$19.50
Northern Coke Foundry, No. 1.....	19.00 to 19.50
Northern Coke Foundry, No. 2.....	18.50 to 18.75
Northern Coke Foundry, No. 3.....	18.00 to 18.25
Northern Scotch, No. 1.....	19.50 to 19.75
Ohio Strong Softeners, No. 1.....	18.55 to 18.80
Ohio Strong Softeners, No. 2.....	18.05 to 18.30
Southern Coke, No. 1.....	18.25 to 18.40
Southern Coke, No. 2.....	17.65 to 17.90
Southern Coke, No. 3.....	17.15 to 17.40
Southern Coke, No. 4.....	16.65 to 16.90
Southern Coke, No. 1 Soft.....	18.15 to 18.40
Southern Coke, No. 2 Soft.....	17.65 to 17.90
Southern Gray Forge and Mottled.....	16.15 to 16.40
Malleable Bessemer.....	18.30 to 18.55
Standard Bessemer.....	19.30 to 19.55
Jackson Co. and Kentucky Silvery, 6 %.....	20.30 to 20.80
Jackson Co. and Kentucky Silvery, 8 %.....	21.30 to 21.80
Jackson Co. and Kentucky Silvery, 10 %.....	23.30 to 23.80

Rails and Track Supplies.—The bookings of the 1907 Rail output of the Illinois Steel Company in less than three weeks is the event of importance in the Rail trade. Practically all of the large Western roads have already placed their orders and all additional tonnage will be transferred to the Carnegie Steel Company. It is estimated that the Rail requirements for 1907 for roads in Illinois Steel territory will easily aggregate 1,000,000 tons. The bookings for this year, including big transfers to the Carnegie Steel Company, amount to 100,000 tons. These heavy purchases accentuate the need of another Rail mill in this district, but the one to be erected at Gary, Ind., will not be in operation until 1908. On Light Rails the mills are booked until August, and to meet the heavy demand for Rail fittings the Illinois Steel Company has just completed a Splice Bar mill at Joliet, which will practically double the company's present capacity. We quote as follows: Angle Bars, accompanying Rail orders, 1906 delivery, 1.50c.; carload lots, 1.75c.; Spikes, 2.25c. to 2.35c.; Track Bolts, 2.65c. to 2.75c., base. Square Nuts, and 2.80c. to 2.90c., base, Hexagon Nuts. The store prices on Track Supplies range from 15c. to 20c. above mill prices. Light Rails, 30 to 45 lb. sections, \$27 to \$28; 25-lb., \$29; 20-lb., \$29 to \$30; 16-lb., \$30 to \$31; 12-lb., \$31 to \$32, and lighter sections down to 8-lb., \$38 to \$40, f.o.b. mill. Standard Sections are unchanged at \$28, f.o.b. mill, full freight to destination.

Metals.—Prices are up all along the line, with the sensational advances of last week on Pig Tin slight as compared with the jump during the past few days. A steady, healthy demand prevails for Copper, and with practically all the speculative material out of the way a full maintenance of prices is anticipated. We quote: Casting Copper, 18½c. to 18¾c.; Lake, 18¾c. to 19¼c., in car lots; small lots, ¼c. to ¾c. higher; Pig Tin, car lots, 53½c. to 54c.; small lots, 54½c. to 55c.; Spelter, prompt delivery, 6.20c. to 6.35c., for car lots; Lead, Desilverized, 6.15c. to 6.25c., for 50-ton lots; Corroding, 6.65c. to 6.75c., for 50-ton lots; on car lots, 2¼c. per 100 lbs. higher; Cookson's Antimony, 33c., and other grades, 30c. to 31c.; Sheet Zinc is \$7.75 list, f.o.b. Laselle, in car lots of 60-lb. casks. On Old Metals we quote: Copper Wire, 16½c.; Heavy Copper, 16¼c.; Copper Bottoms, 15½c.; Copper Clips, 15¼c.; Red Brass, 15½c.; Red Brass Borings, 13¾c.; Yellow Brass, 12¼c.; Yellow Brass Borings, 10¼c.; Light Brass, 8¾c.; Lead Pipe, 4¾c.; Tea Lead, 4¾c.; Zinc, 4½c.; Pewter, No. 1, 24c.; Tin Foil, 32c.; Block Tin Pipe, 27½c.

(By Mail.)

Billets and Rods.—We note the sale of 2500 tons of special analysis Bessemer Billets, for delivery the ensuing three months. This is the largest transaction that has been recorded in this market for some time. Forging Billets continue to be offered at from \$31 to \$35, f.o.b. Chicago. Bessemer and Basic Open Hearth Rods are quiet and are held at \$35 to \$36.

Structural Material.—Structural fitters are now speci-

fying more freely than they have been at any time this year, and mill shipments are deferred from two to three months. The settlement of the Structural Iron workers' strike has resulted in a resumption of operations on all of the large buildings in the downtown district, and many other crafts affected by the idleness of the Structural workers have resumed work. No contracts of importance have been closed in this district during the past week, although considerable work is under consideration. Quotations are firm and unchanged, as follows: Beams and Channels, 3 to 15 inches, inclusive, 1.86½c.; Angles, 3 to 6 inches, ¼-inch and heavier, 1.86½c.; Angles, larger than 6 inches on one or both legs, 1.96½c.; Beams, larger than 15 inches, 1.96½c.; Zees, 3 inches and over, 1.86½c.; Tees, 3 inches and over, 1.91½c., in addition to the usual extras for cutting to extra lengths, punching, coping, bending or other shop work.

Plates.—Structural fitters are now specifying more freely and the mills report a slight increase in tonnage specifications. On Sheared Plates deliveries can be made fairly promptly, but Universal sizes are in such heavy demand that most of the mills cannot promise deliveries in less than 30 days. No changes have been made in prices, which are as follows: Tank quality, ¼-inch and heavier, wider than 6¼ and up to 100 inches wide, inclusive, car lots, Chicago, 1.76½c.; 3-16 inch, 1.86½c.; Nos. 7 and 8 gauge, 1.91½c.; No. 9, 2.01½c.; Flange quality, in widths up to 100 inches, 1.86½c., base, for ¼-inch and heavier, with the same advances for lighter weights; Sketch Plates, Tank quality, 1.86½c.; Flange quality, 1.96½c. Store prices on Plates are as follows: Tank Plate, ¼-inch and heavier, up to 72 inches wide, 2c. to 2.10c.; from 72 to 96 inches wide, 2.10c. to 2.20c.; 3-16 inch up to 60 inches wide, 2.10c. to 2.20c.; 72 inches wide, 2.35c. to 2.45c.; No. 8, up to 60 inches wide, 2.15c. to 2.25c.; Flange and Head quality, 25c. extra.

Sheets.—The market on both Black and Galvanized Sheets shows increased strength from week to week, and consumers would not be surprised to learn of an advance at an early date. Independent mills are firmly maintaining official quotations, being in no position to shade prices owing to the high cost of their raw materials. Mill shipments of practically all sizes are delayed from six weeks to two months, and jobbers' stocks are comparatively small. We quote as follows: Blue Annealed, Nos. 9 and 10, 1.86½c. to 1.91½c.; Nos. 16 and 17, 2.06½c. to 2.11½c.; Box Annealed, Nos. 18 to 20, 2.26½c. to 2.31½c.; No. 27, 2.46½c. to 2.51½c.; No. 28, 2.56½c. to 2.61½c.; Galvanized Sheets, Nos. 10 to 14, 2.61½c.; Nos. 17 to 21, 2.86½c.; Nos. 22 to 24, 3.01½c.; Nos. 25 and 26, 3.21½c.; No. 27, 3.41½c.; No. 28, 3.61½c.; No. 30, 4.11½c. Sheets from store: Blue Annealed, Nos. 10 and 11, 2.10c. to 2.20c.; Nos. 12 and 13, 2.15c. to 2.25c.; Nos. 14 and 15, 2.20c. to 2.30c.; No. 16, 2.30c. to 2.40c. Box Annealed: Nos. 18 to 20, 2.50c. to 2.55c.; Nos. 22 to 24, 2.55c. to 2.60c.; No. 26, 2.60c. to 2.65c.; No. 27, 2.65c. to 2.70c.; No. 28, 2.75c. to 2.80c.; No. 30, 3.15c. to 3.20c. Galvanized from store: Nos. 10 to 20, 3c. to 3.05c.; Nos. 22 to 24, 3.15c. to 3.20c.; No. 26, 3.35c. to 3.40c.; No. 27, 3.55c. to 3.60c.; No. 28, 3.75c. to 3.80c.; No. 30, 4.95c. to 5c.

Bars.—Steel Bar specifications, while much lighter than earlier in the year, are coming forward more freely than during the month of April, indicating that some of the implement manufacturers are already receiving filling-in orders. A fair demand continues for Iron Bars, and while no very large tonnages are being placed small orders are numerous, and the mills without exception report a larger tonnage on their books than on March 1. Quotations are firmly maintained as follows: Iron Bars, 1.66½c.; Steel Bars, 1.66½c., both half extras; Hoops, 2.06½c., extras as per Hoop card; Bands, 1.66½c., as per Steel card; Soft Steel Angles and Shapes, 1.66½c., half extras. Store prices are as follows: Bar Iron, 2.10c.; Steel Bars, 1.85c., and as high as 2c. is asked on certain scarce sizes; Steel Bands, 1.85c. to 1.90c., half extras; Soft Steel Hoops, 2.30c. to 2.40c., full extras.

Merchant Pipe.—All of the mills report a heavy demand for all Merchant sizes, consumption being stimulated by the heavy building movement that is under way throughout this section. Owing to the low prices that are prevailing there is practically no shading of prices. Quotations continue low and unchanged, on the basis of 81 per cent. off the list, Pittsburgh, although official discounts on car lots, Chicago, remain as follows: Black Steel Pipe, 78.35 per cent. on the base sizes, ¾ to 6 inches, and Galvanized, 68.35 per cent. Iron Pipe is quoted from 1½ to 2 points higher. From store in small lots Chicago jobbers are quoting 76½ to 77 per cent. on Black Steel Pipe, ¾ to 6 inches.

Boiler Tubes.—The low prices have proved an incentive to large consumers to place orders with the mills, and contracts are being closed to cover future requirements. Discounts on base sizes, 2¼ to 5 inches, in car lots are as follows: Steel Tubes, 68.35; Iron, 55.35; Seamless, 50.35; 2½-inch and smaller and lengths over 18 feet, and 2½-inch and lengths over 22 feet, 10 per cent. extra. Store prices are unchanged, as follows:

	Steel.	Iron.	Seamless.
1 to 1½ inches.....	40	35	42½
1½ to 2¼ inches.....	50	35	35
2¼ inches.....	52½	35	30
2½ to 5 inches.....	60	47½	42½
6 inches and larger.....	50	35	..

Cast Iron Pipe.—The city of New Orleans closes this week for 10,000 tons of small Pipe, this being the largest order that has been under consideration for some time. Otherwise municipal lettings are of little importance, no large projects being under way. Quotations are unchanged, as follows: Water Pipe, 4-inch, \$31; 6, 8, 10 and 12 inch, \$30; over 12-inch, \$29, with \$1 extra for Gas Pipe. Large municipal contracts are usually placed at somewhat lower basis.

Merchant Steel.—Specifications for special shapes have fallen off materially, owing to the curtailed requirements of the agricultural trade. Practically all of the contracts for the tonnage required during the ensuing 12 months by these manufacturers has now been placed with the mills. No changes have been made in prices, which are as follows: Planished or Smooth Finished Tire Steel, 1.86½¢; Iron Finish up to 1½ x ½ inch, 1.81½¢; Iron Finish, 1½ x ½ inch and larger, 1.66½¢, base; Channels for solid rubber tires, ¾ to 1 inch, 2.16½¢, and 1½ inch and larger, 2.06½¢; Smooth Finished Machinery Steel, 1.91½¢; Flat Sleigh Shoe, 1.71½¢; Concave and Convex Sleigh Shoe, 1.96½¢; Cutter Shoe, 2.35¢; Toe Calk Steel, 2.21½¢; Railway Spring, 1.86½¢; Crucible Tool Steel, 6½¢ to 8¢, and still higher prices are asked on special grades. Shafting, 50 per cent. off on car lots and 45 per cent. in less than car lots, in base territory.

Coke.—The molders' strike, which has resulted in a decided curtailment of foundry melt throughout this section, has resulted in a decided weakening of the Coke market. Connellsville 72-hour Foundry Coke is freely offered on the basis of \$5.65, Chicago, and consignments have been sold during the week at concessions of 10c. to 15c. a ton. Virginia grades have been offered as low as \$4.75, although the prevailing price is \$5. By-Product Coke on contracts is quoted at \$5.65, and in car lots for prompt delivery \$5.80 is asked.

Old Material.—Western Iron mills have purchased Borings and Wrought Scrap very freely during the week, one interest having taken in 3000 tons, while another purchased a lot of 1000 tons of No. 1 Wrought. Prices, on the whole, are somewhat firmer than they have been and the dealers are encouraged, believing that somewhat higher prices will prevail before the summer months. The heavy offering of the Chicago & Northwestern, Santa Fé and the Chicago, Milwaukee & St. Paul railroads, aggregating 5000 tons, were readily absorbed without materially affecting prices, indicating that the market has a firmer undertone. The range of prices paid by large consumers to producers and dealers, per gross ton, car lots, f.o.b. Chicago, is as follows:

Old Iron Rails.....	\$21.25 to \$21.50
Old Steel Rails, 4 feet and over.....	16.00 to 16.50
Old Steel Rails, less than 4 feet.....	14.00 to 14.50
Heavy Relaying Rails, subject to inspection, 50 pounds and under.....	27.00 to 27.50
Old Car Wheels.....	19.00 to 19.50
Heavy Melting Steel Scrap.....	13.50 to 14.00
Frogs, Switches and Guards.....	13.50 to 14.00
Mixed Steel.....	12.00 to 12.50

The following quotations are per net ton:

Iron Fish Plates.....	\$16.50 to \$17.00
Iron Car Axles.....	23.00 to 23.50
Steel Car Axles.....	18.00 to 18.50
No. 1 Railroad Wrought.....	14.50 to 15.00
No. 2 Railroad Wrought.....	13.50 to 14.00
Locomotive Tires, smooth.....	14.00 to 14.50
Railway Springs.....	13.50 to 14.00
No. 1 Dealers' Forge.....	12.00 to 12.50
Mixed Bushing.....	10.25 to 10.50
Iron Axle Turnings.....	10.25 to 11.00
Soft Steel Axle Turnings.....	10.25 to 11.00
Machine Shop Turnings.....	10.25 to 11.00
Cast Borings.....	8.75 to 9.00
Mixed Borings, &c.....	8.75 to 9.00
No. 1 Mill.....	9.00 to 9.25
No. 2 Mill.....	8.00 to 8.25
No. 1 Rollers, cut to Sheets and Rings..	9.50 to 10.00
No. 1 Cast Scrap.....	13.50 to 14.00
Stove Plate and Light Cast Scrap.....	11.00 to 11.50
Railroad Malleable.....	13.50 to 14.00
Agricultural Malleable.....	12.50 to 13.00

Irvin McDowell, Chicago, who for many years has been identified with the Pig Iron trade, during recent years being associated with David Evans, has been admitted into partnership with Mr. Evans, and the business will hereafter be conducted under the name of David Evans & Co.

Announcement is made of the revival of the firm of Fieser & Bentley, at Columbus, Ohio, which will occupy its old offices in the Wyandotte Building. Linn Bentley, who has conducted the business of Linn Bentley & Co. since the retirement of Louis F. Fieser, has again associated himself with the latter. The firm deals in pig iron, steel, ore, coke and mill cinder.

Philadelphia.

REAL ESTATE TRUST BUILDING, May 15, 1906.

As far as regards appearances in the Iron and Steel trades, such a catastrophe as that in California might never have occurred. Conditions to-day are just about as they were a month ago, minus the strike. Whether a reaction is to be felt at a later date or not remains to be seen, but for the present business could hardly be more satisfactory than it is. There are a few dull spots, but not enough to affect the general average. Buying during the past few days has been more confident, and whether the position be well taken or not, there is less hesitation in contracting for long deliveries than there has been at any time within the past several weeks. The strongest feature is in the uniformity of the demand. There is no specially dominating interest, neither is the activity confined to any particular district. The Central West is taking a larger proportion than usual of material that frequently supplies eastern Pennsylvania, and to an even greater extent the same may be said of the New England States and New York. The consequence is that the local territory is unusually short of material for early deliveries, while prices are of course very firm. These movements indicate that consumption is maintained in all quarters at the highest point yet reached, and from the fact that rather heavy buying is being done for the third quarter it is fair to assume that consumers have plenty of work for that period. Some rather important buying has also been done for the fourth quarter, and in at least one instance a considerable tonnage has been taken for the first quarter of 1907. It is also somewhat remarkable that, at a price, almost any grade of Pig Iron can find buyers. Foundry Irons are probably most in demand, all the way from the high grades down to Nos. 3 and 4. Mill Irons at about \$16.50 are well taken, also Malleable and Charcoal Irons at full market prices, say, \$21 to \$21.50, delivered, for the latter and \$19.25 for the former. Basic Irons are relatively dull, but there is a good deal of inquiry and a lot of business is expected in the near future. This class of material is very scarce, however, and prospects for easier conditions are not bright. Some of the furnaces have made inquiries, asking what proportion of deliveries of Basic Iron will be required during June and July, the answer to which in all cases has been that every ton will be required and that no curtailment must be made under any circumstances. These are the conditions as they are to-day, and although they are better than seemed possible two or three weeks ago, yet it is no use for the sake of a theory to ignore such palpable evidences of strength and activity as prevail at the present time.

Pig Iron.—As we have already stated, the market is entirely in sellers' favor. Makers see no necessity for soliciting business; all that they need to do is to discriminate in the distribution of what they may have for sale, and what prices they should get for it. This does not by any means imply that consumers are willing to pay any price to get Iron, but to get what they want at reasonable figures they have to decide promptly, or they are liable to get left. It is not impossible that things may loosen up after awhile, but as long as the margin between supply and demand is as narrow as it is to-day there is not much chance for that. The only means by which that end can be attained appears to be by decreased consumption or by increased supply, neither of which has enough probability to give promise of relief in the near future. These conditions are so well understood by the trade that they have almost given up guessing. Consumers cover their known requirements at current quotations, while makers are so well satisfied with their position that they seem to have no desire to make a market beyond what comes to them from day to day. There must, of course, be a change some time, but how soon and in what direction is beyond human foresight. It is a good thing, however, that in the meanwhile both sides are satisfied, and, being in that frame of mind, there is no reason why anything but normal conditions should prevail. After awhile the trend of the market will become more distinct, but for the present there is nothing in sight likely to cause any change from to-day's prices, which for Philadelphia and nearby deliveries are about as follows:

No. 1 X Foundry.....	\$19.25 to \$19.50
No. 2 X Foundry.....	18.50 to 19.00
No. 2 Plain.....	18.25 to 18.50
Standard Gray Forge.....	16.50 to 16.75
Ordinary Gray Forge.....	16.00 to 16.25
Basic.....	17.50 to 17.75
Low Phosphorus.....	24.50 to 25.00
Malleable.....	19.25 to 19.50
Bessemer.....	20.00 to 20.25
Lake Superior Charcoal.....	21.00 to 21.50

Steel.—There is no abatement in the demand, and prices are firmly maintained at \$29 to \$29.50, delivered, for good sized lots of Open Hearth Billets, and \$32 to \$35 for Forging Billets. Mills are pushed for deliveries, and as far as can be seen these conditions are likely to continue indefinitely.

Steel Alloys.—There is a perceptible easing up, owing to more liberal supplies and to large offerings of shipments

to be made at comparatively early dates. Asking prices are about \$35 on dock for Spiegel, and for last half year about \$80 for Ferro; June and July deliveries could be had at \$95 to \$100.

Plates.—The situation in the Plate trade is not materially different from what it has been for some time past. There is enough demand to maintain the *status quo*, but no important business has been placed very recently. Day to day orders are satisfactory, particularly for Universal Plates, but prompt deliveries could be given on moderate tonnages of Sheared Plates. Quotations are unchanged, as follows:

	Carload. Cents.	Part carload. Cents.
Tank, Bridge and Boat Steel.....	1.73½	1.78½
Flange or Boiler Steel.....	1.83½	1.88½
Marine.....	2.13½	2.18½
Locomotive Fire Box Steel.....	2.23½	2.28½

The above are base prices for ¼-inch and heavier. The following extras apply:

3-16-inch thick.....	\$0.10
Nos. 7 and S. B. W. G.....	.15
No. 9, B. W. G.....	.25
Plates over 100 to 110 inches.....	.05
Plates over 110 to 115 inches.....	.10
Plates over 115 to 120 inches.....	.15
Plates over 120 to 125 inches.....	.25
Plates over 125 to 130 inches.....	.50
Plates over 130 inches.....	1.00

Structural Material.—Conditions are much the same as they have been for several weeks, the demand being quite active for early deliveries, while for long deliveries a large tonnage is already engaged. No particular change is looked for, as the increase in the productive capacity seems to meet the miscellaneous requirements of the trade. Prices are unchanged, as follows: Beams, Channels and Angles, 1.83½c. to 2c., delivered.

Bars.—The situation in the Bar trade is not entirely what could be desired, although for the time being mills are pretty well employed. Specifications are satisfactory, and mills that make first-class qualities are getting business at 1.63½c., although the tonnage is a little disappointing. Steel Bars are in much the same position, and fairly good deliveries can be had at the price named for either Iron or Steel Bars.

Sheets.—There is no change in the Sheet trade, although there is enough business to keep the mills moderately employed at about the following prices for ordinary sized lots: Nos. 18 to 20, 2.40c.; Nos. 22 to 24, 2.50c.; Nos. 25 and 26, 2.60c.; No. 27, 2.70c., and No. 28, 2.80c.

Old Material.—The market is a little difficult to gauge, as opinions differ very widely in regard to values. Actual selling prices, however, are no better than they were a week ago, and some buyers refuse materials offered to them at what appears to be very attractive figures. The following quotations of bids and offers for deliveries in buyers' yards are fairly representative figures:

Scrap Steel Rails and Crops.....	\$16.50 to \$16.75
No. 1 Steel Scrap.....	16.25 to 16.50
Low Phosphorus Scrap.....	20.50 to 21.00
Old Steel Axles.....	19.50 to 20.00
Old Iron Axles.....	25.50 to 26.00
Old Iron Rails.....	21.00 to 21.50
Old Car Wheels.....	16.75 to 17.00
Choice Scrap, R. R., No. 1 Wrought.....	19.00 to 19.50
Choice No. 1 Yard Scrap.....	18.00 to 18.50
Long and Short.....	16.50 to 17.00
Machinery Scrap.....	15.50 to 16.00
Wrought Iron Pipe.....	14.50 to 15.00
No. 1 Forge Fire Scrap.....	15.00 to 15.50
No. 2 Light Ordinary.....	10.50 to 11.00
Wrought Turnings.....	13.00 to 13.50
Axle Turnings, Choice Heavy.....	14.00 to 14.50
Stove Plate.....	11.50 to 12.00
Cast Borings.....	9.50 to 10.00

Cincinnati.

FIFTH AND MAIN STS., May 16, 1906.—(By Telegraph.)

Pig Iron.—The market during the past week has been rather quiet. Inquiries, as a rule, have been for small tonnage and prompt delivery. The heavier melters have evidently decided that the situation at present is not such as would warrant them in contracting for the remainder of the year's supply, and consequently have merely bought enough iron to keep their plants in operation. Reports indicate that there is considerable spot iron in stock and en route that is not without its effect on the general market. It is said that one of the large agricultural concerns is about ready to come into the market for its year's supply, which will probably be followed by a number of others. Prices for Southern brands are quotable at last week's schedule, with the bulk of the business going at the minimum figure. Valley Basic is reported to be somewhat weak at \$16.75, Valley furnace. Malleable Bessemer is fairly strong, with several sales of medium tonnage. Gray Forge is reported in easy demand, with an ample supply to cover all requirements. Reports received from foundrymen indicate that there is not so much complaint on account of lack of busi-

ness, but rather of inability to secure sufficient molders to make contract deliveries. We are told of one sale of about 2000 tons Northern and Southern that went to a stove company in Michigan, 850 tons of No. 2 Southern for a melter in Indiana and 1500 tons of Basic, third quarter delivery, that was taken by a local melter. Freight rates from the Hanging Rock district are \$1.15 and from Birmingham \$3. We quote, f.o.b. Cincinnati, as follows:

Southern Coke, No. 1.....	\$17.25 to \$17.50
Southern Coke, No. 2.....	16.75 to 17.00
Southern Coke, No. 3.....	16.25 to 16.50
Southern Coke, No. 4.....	15.75 to 16.00
Southern Coke, No. 1 Soft.....	17.25 to 17.50
Southern Coke, No. 2 Soft.....	16.75 to 17.00
Southern Coke, Gray Forge.....	15.00 to 15.25
Southern Coke, Mottled.....	14.50 to 14.75
Ohio Silvery, No. 1 (8 per cent. Silicon).....	21.65 to 22.15
Lake Superior Coke, No. 1.....	17.65 to 18.15
Lake Superior Coke, No. 2.....	17.15 to 17.65
Lake Superior Coke, No. 3.....	16.65 to 17.15

Car Wheel Irons.

Standard Southern Car Wheel.....	\$23.50 to \$24.00
Lake Superior Car Wheel.....	22.00 to 22.50

Coke.—There is a rather weak tendency manifest. The demand is light, with a plentiful supply available. We quote best brands of Connellsville and Virginia Foundry at \$2.75 to \$3, f.o.b. ovens.

Finished Iron and Steel.—The market is firm, with new specifications slightly more active. Prices are reported to be unchanged, although there is a rumor that Bar Iron is to be advanced at an early date. We quote, f.o.b. Cincinnati, as follows: Iron Bars, in carload lots, 1.63c., with half extras; the same, in smaller lots, 2c., with full extras; Steel Bars, in carload lots, 1.63c., with half extras; the same, in small lots, 1.85c., with full extras; Base Angles, 1.83c., in carload lots; Beams and Channels, in carload lots, 1.83c.; Plates, ¼-inch and heavier, 1.73c., in carload lots; in smaller lots, 1.90c.; Sheets, 16 gauge, in carload lots, 2.15c.; in smaller lots, 2.70c.; 14 gauge, in carload lots, 2.05c.; in small lots, 2.60c.; Steel Tire, 1 x ¼ inch or heavier, 1.83c., in carload lots.

Old Material.—There are no special signs of activity, the mills apparently not doing any heavy buying. We quote dealers' prices, f.o.b. Cincinnati, as follows: No. 1 Railroad Wrought Scrap, \$15 to \$15.50 per net ton; Cast Borings, \$5 to \$6 per net ton; Steel Turnings, \$8 to \$9 per net ton; No. 1 Cast Scrap, \$12 to \$13 per net ton; Iron Rails, \$21 to \$22 per gross ton; Steel Rails, rolling mill lengths, \$15 to \$16 per gross ton; Relaying Rails, 56 lbs., and upward, \$28 to \$29 per gross ton; Iron Axles, \$22 to \$23 per net ton; Car Wheels, \$17.50 to \$18.50 per gross ton; Low Phosphorus Scrap, \$18 to \$19 per gross ton.

E. S. Rooney, formerly assistant sales manager of the Carnegie Steel Company, Cincinnati, who was recently transferred to the general office, has resigned to open a Pittsburgh office for the Youngstown Sheet & Tube Company, Youngstown, Ohio.

Pittsburgh.

PARK BUILDING, May 16, 1906.—(By Telegraph.)

Pig Iron.—Following the recent heavy sales of Bessemer and Basic Pig Iron the market has quieted down, and only a small amount of Pig Iron is changing hands. The quietness in Bessemer is largely due to the fact that there is very little for sale for delivery prior to July 1, but several of the large Steel companies are still very short of Pig Iron, and would probably buy heavily of Bessemer Iron if it could be had. Bessemer Pig is very firm at \$17.25 to \$17.50, Valley furnace, while Basic is also strong at \$17 to \$17.25, Valley furnace. Some inquiries are in the market for Foundry Iron for third and fourth quarter delivery, and it is expected that some tonnage will be placed before long. We quote Northern brands of No. 2 Foundry at \$16.50, Valley furnace, while small lots are selling as high as \$17. There is very little demand for Gray Forge, and it is held at \$15.65 to \$15.75, Valley furnace, or \$16.50 to \$16.60, Pittsburgh.

Steel.—The available supply of both Bessemer and Open Hearth Billets seems to be larger and prices are a shade easier. Steel mills outside the Pittsburgh district are offering Bessemer Billets at \$26 and Open Hearth at \$27, delivered Pittsburgh, and some tonnage has been sold at these prices. Sheet and Tin Bars continue scarce, and several Sheet mills whose contracts for Bars expire July 1 may possibly have trouble in renewing them with the former source of supply. We quote Sheet and Tin Bars in random lengths at \$28, Pittsburgh, with an advance of 50c. a ton for Cut Bars.

(By Mail.)

The week under review has been quiet. It is stated that the Bessemer Pig Iron Association has less than 5000 tons of Bessemer Iron to sell for delivery prior to July 1, and that this Iron is under option to the Steel Corporation. Several of the large Steel interests would undoubtedly buy Bessemer Iron for prompt shipment if it could be had. We note a fair demand for Foundry and Forge Iron. The market on Bessemer and Open Hearth Billets is easier, and out of town mills are offering Bessemer Billets at \$26, Pittsburgh. Some large Rail inquiries are in the market. The demand for Finished Iron and Steel is fairly large, but there is some complaint that specifications are not coming forward as freely as the mills would desire. An early advance in prices of Tin Plate by the leading interest, on account of the high price of Tin, would not be a surprise to the trade.

Ferromanganese.—Prices have shown a sharp decline and for prompt delivery it is being offered at \$85 to \$90, Pittsburgh. For extended delivery 80 per cent. foreign is offered at \$75, Pittsburgh.

Muck Bar.—There is practically no inquiry and prices are rather weak. We quote best grades, made from all Northern Pig Iron, at \$28.50, Pittsburgh.

Steel Rails.—Of the Pennsylvania Railroad order, the Carnegie Steel Company took 90,500 tons, the balance being divided between other mills. Contracts placed during the week include 13,000 tons for the Wabash, of which 10,000 tons are for next year and 3000 tons for this year delivery. The demand for Light Rails is very active and the market is firm. We quote Standard Sections at \$28 at mill. We quote Light Rails as follows: 8-lb., \$36; 10-lb., \$32; 12-lb., \$30; 16-lb., \$29; 20-lb., \$28.50; 25 to 45 lb., \$27.50 to \$28, maker's mill.

Rods.—There has been considerable demand for Rods in the past week and they are very firm for prompt delivery. We quote Bessemer and Open Hearth at \$34.50 to \$35, while Chain Rods are held at \$35 and higher, Pittsburgh.

Skelp.—Not much new business is being placed, but the mills are fairly busy on contracts. Prices are fairly strong and we quote: Grooved Steel Skelp, 1.57½c. to 1.60c.; Sheared Steel Skelp, 1.60c. to 1.65c.; Grooved Iron Skelp, 1.65c. to 1.70c.; Sheared Iron Skelp, 1.75c. to 1.80c., Pittsburgh, these prices being for ordinary widths and gauges.

Structural Material.—Local contracts placed during the week include extensions to the Fort Pitt Hotel and the Philadelphia Company Building, both taken by the American Bridge Company. It is evident that some of the large jobs that were figured on for this year will have to go over until next year, as the leading Structural shops are practically filled for the balance of this year. Deliveries from the mills are quite satisfactory and there is very little delay in getting Material promptly. Prices are firm and we quote: Beams and Channels, up to 15-inch, 1.70c.; over 15-inch, 1.80c.; Angles, 3 x 2 x ¼ inch thick up to 6 x 6 inches, 1.75c.; 8 x 8 and 7 x 3½ inches, 1.80c.; Zees, 3-inch and larger, 1.70c.; Tees, 3-inch and larger, 1.75c. Under the Steel Bar card Angles, Channels and Tees under 3-inch are 1.60c., base, for Bessemer and Open Hearth, subject to half extras on the Standard Steel Bar card.

Plates.—The demand for Sheared Plates is rather light, and the mills are in position to make fairly prompt deliveries. Some large inquiries are in the market from car builders and Structural shops. The Plate mills still complain of a shortage in Steel, which is interfering with output to some extent. There is more or less unevenness in prices, especially on narrow sizes, which are shaded on good orders to the extent of about \$2 a ton. Official prices, which, however, are not strictly maintained, are as follows: Tank Plates, ¼-inch thick, 6¼ up to 100 inches in width, 1.60c., base, at mills, Pittsburgh. Extras over the above prices are as follows:

	Extra per 100 pounds.
Gauges lighter than ¼ inch to and including 3-16-inch Plates on thin edge.....	\$0.10
Gauges Nos. 7 and 8.....	.15
Gauge No. 9.....	.25
Plates over 100 to 110 inches.....	.05
Plates over 110 to 115 inches.....	.10
Plates over 115 to 120 inches.....	.15
Plates over 120 to 125 inches.....	.25
Plates over 125 to 130 inches.....	.50
Plates over 130 inches.....	1.00
All sketches (excepting straight taper Plates varying not more than 4 inches in width at ends, narrowest end being not less than 30 inches)....	.10
Complete Circles.....	.20
Boiler and Flange Steel Plates.....	.10
"A. B. M. A." and ordinary Fire Box Steel Plates.....	.20
Still Bottom Steel.....	.30
Marine Steel.....	.40
Shell Grade of Steel is abandoned.	

TERMS.—Net cash 30 days. For anticipated payments a maximum discount may be allowed at the rate of 6 per cent. per annum and for a longer time than 30 days interest shall be charged at the same rate per annum. Invoices paid within ten days from date thereof, discount of ½ of 1 per cent. is allowable. Pacific Coast base, 1.60c., f.o.b. Pittsburgh, with all rail tariff rate of freight to destination added, no reduction for rectangular shapes 14 inches wide down to 6 inches of Tank, Ship or Bridge quality.

Sheets.—Prices on Sheets are firmer than for some

time, and some mills that were recently willing to make concessions have withdrawn them. The demand is fairly active, and the mills are pretty well filled up with tonnage to July 1 or longer. We quote: Black Sheets, Box Annealed, one pass through cold rolls, Nos. 10 to 12 gauge, 1.95c. to 2c.; Nos. 13 and 14, 2c. to 2.05c.; Nos. 15 and 16, 2.05c. to 2.10c.; Nos. 17 to 21, 2.10c. to 2.15c.; Nos. 22 to 24, 2.15c. to 2.20c.; Nos. 25 and 26, 2.20c. to 2.25c.; No. 27, 2.25c. to 2.30c.; No. 28, 2.35c. to 2.40c.; No. 29, 2.50c. to 2.55c., and No. 30, 2.60c. to 2.65c. We quote Galvanized Sheets as follows: Nos. 10 and 11, 2.30c. to 2.35c.; Nos. 12 to 14, 2.40c. to 2.45c.; Nos. 15 and 16, 2.50c. to 2.55c.; Nos. 17 to 21, 2.65c. to 2.70c.; Nos. 22 to 24, 2.80c. to 2.85c.; Nos. 25 and 26, 3c. to 3.05c.; No. 27, 3.20c. to 3.25c.; No. 28, 3.40c. to 3.45c.; No. 29, 3.65c. to 3.70c., and No. 30, 3.90c. to 3.95c. We quote No. 28 Gauge Painted Roofing Sheets at \$1.60 to \$1.65 per square, and Galvanized Roofing Sheets, No. 28 Gauge, at \$2.95 to \$3 per square for 2-inch corrugations. These prices are for carload lots, jobbers charging the usual advances for small lots from store.

Bars.—The demand for both Iron and Steel Bars in the last week or ten days has been rather light, but specifications on contracts, some of which were placed some time ago, when prices of Iron Bars were \$2 a ton higher than they are today, are coming forward quite freely. The mills still have a good deal of work ahead of them, and it is believed the demand will soon show betterment. We quote: Iron and Steel Bars at 1.50c., base, half extras, for carloads and larger lots, f.o.b. Pittsburgh.

Cotton Ties.—Practically all of the tonnage in Cotton Ties for this year has been placed, the mills now filling the large contracts placed some time ago at 85c. per bundle.

Hoops and Bands.—We are advised that a fair volume of new business in Hoops and Bands is being placed at the full official price of 1.90c. Specifications on old contracts placed with the mills before prices were advanced are coming in very freely. We quote Steel Hoops at 1.90c., and Bands for all purposes at 1.50c., base, half extras, as per Standard Steel card. These prices are for carload lots, f.o.b. Pittsburgh, plus full tariff rail rate to point of delivery, an advance of \$2 a ton being charged for less than carloads.

Tin Plate.—The present situation in the Tin Plate trade is an unusual one, and it would seem that existing conditions would demand an early advance in prices. The large Tin Plate mills are filled with tonnage to October 1 or longer, some of the mills having very little to sell for the rest of this year. A good portion of this was taken some time ago before prices were advanced, and the cost of making Tin Plate has steadily increased since that time. Pig Tin is now quoted at the highest prices ever known, while Tin Bars to the independent Tin Plate mills are \$28 per ton, f.o.b. Pittsburgh. It is claimed that with the present cost of raw material none of the outside mills can make Tin Plate at \$3.60 a box and sell it at a profit. In fact, several of them have withdrawn from the market as sellers at the official price and are quoting as high as \$3.75 a box. It is very likely that in the event of the present prices of Pig Tin being maintained the American Sheet & Tin Plate Company and the leading independent mills will make an early advance. It is claimed that it should be selling to-day at \$4 per base box in order to allow a profit. We quote Tin Plate at \$3.60 per base box, f.o.b. Pittsburgh, for 14 x 20 100-lb. Cokes, terms 30 days, less 2 per cent. off for cash in ten days, on which price a rebate of 5c. a box is allowed for carloads and larger lots.

Merchant Steel.—Only a fair amount of new business is being placed, this being the dull season in this trade. The large implement makers have closed contracts for their requirements for the year commencing July 1, and the mills have a very large tonnage on their books. Prices are firm, as follows: Planished or Smooth Finished Tire Steel, 1.70c.; Iron Finish up to 1½ x ½ inch, 1.65c., and Iron Finish, 1½ x ½ inch and larger, 1.50c., base, Pittsburgh, and Channels for solid rubber tire are quoted as follows: ¼, ⅝ and 1 inch, 2c., and 1½-inch and larger, 1.90c.; Toe Calk Steel, 2c. to 2.05c.; Railway Spring Steel, 1.75c. to 1.80c.; Cutter Shoes, 2.20c. to 2.25c.; Flat Sleigh Shoe, 1.50c. to 1.55c.; Crucible Tool Steel, 6c. to 8c. for ordinary grades and 12c. and upward for special grades. We quote Cold Rolled Shafting at 50 per cent. discount in carloads and 45 per cent. in less than carloads, delivered in base territory.

Railroad Spikes.—We note a very heavy demand, the mills being filled with orders, and prices are very firm. The absolute minimum on standard sizes of Railroad Spikes is \$2, with some mills refusing to sell at less than \$2.05 per 100 lbs., f.o.b. Pittsburgh. Boat Spikes have been advanced 5c. per 100 lbs.

Spelter.—The demand continues very dull, prices being only fairly strong. We quote prime grades of Western at 5.85c., St. Louis, equal to 5.97½c., Pittsburgh.

Merchant Pipe.—The tonnage of new business in Pipe continues unusually heavy, and on Merchant sizes and also on the larger sizes the mills are filled up for several months. The Wichita Natural Gas Company, which placed a contract some time ago for 230 miles of Line Pipe, will prob-

ably result in additional Pipe lines being placed, as it is the intention of this company to sell gas to other concerns from its trunk line in Kansas. It is expected that inquiries for some of these branch lines will be in the market before very long. Prices on Pipe continue very low, and to some mills are below actual cost of production. The extreme discount on Merchant sizes of Steel Pipe remains at 81 and 5 per cent. off. This price, however, is being made only to the very large trade. The official discounts, which are shaded about one point, are as follows:

	Merchant Pipe.			
	Steel		Iron	
	Black.	Galv.	Black.	Galv.
1/2 and 3/4 inch.....	72	56	69	53
3/4 inch.....	74	60	71	57
1/2 inch.....	76	64	73	61
3/4 to 6 inches.....	80	70	77 1/2	67 1/2
7 to 12 inches.....	75	60	72 1/2	57
Extra strong, plain ends:				
1/2 to 3/4 inch.....	65	53	62	50
3/4 to 4 inches.....	72	60	69	57
4 1/2 to 8 inches.....	68	56	65	53
Double extra strong, plain ends:				
1/2 to 8 inches.....	61	50	58	47

Boiler Tubes.—We note a continued heavy demand for Locomotive Tubes, prices on which are very firm. On Merchant Tubes discounts are being shaded about four points, or \$8 a ton, for large lots. Official discounts, which are shaded to this extent only on Merchant Tubes, are as follows:

	Boiler Tubes.	Iron.	Steel.
1 to 1 1/2 inches.....		41	46
1 1/2 to 2 1/4 inches.....		41	58
2 1/2 inches.....		46	60
2 3/4 to 5 inches.....		53	66
6 to 13 inches.....		41	58

Iron and Steel Scrap.—The demand for Scrap continues light, being mostly for small lots. The large consumers at Steubenville, Sharon and in this city are pretty well covered, and are not in the market, being undecided as to whether it is an opportune time to buy Scrap for forward delivery. Heavy Steel Scrap continues to sell at about \$2.50 a ton less than Bessemer Pig Iron, while intrinsically it is worth as much or more. Dealers quote as follows: Heavy Melting Scrap, \$15; Bundled Sheet Scrap, \$13.75 to \$14; Machinery Cast Scrap, \$15; No. 1 Wrought Scrap, \$16.50 to \$16.75; Old Steel Rails, \$15; Old Steel Rails, long pieces for rerolling, \$15.50; Old Car Wheels, \$17.25 to \$17.50; Stove Plate, \$11 to \$11.25; Old Iron Axles, \$24 to \$24.50; Old Steel Axles, \$20 to \$20.50; Axle Turnings, \$13.50 to \$13.75; Cast Iron Borings, \$8; Wrought Turnings, \$12, all in gross ton, f.o.b. Pittsburgh.

Coke.—The Coke trade is showing the effects of the settlement of the Anthracite Coal strike, and shipments to Eastern points are falling off. There is a fair demand for Furnace and Foundry Coke, but most consumers are covered by contracts. Prices are easier and strictly Connells-ville Furnace Coke can readily be had at \$2.50, and 72-hour Foundry at \$2.75 to \$2.85 a ton at oven. Main line brands of Furnace Coke are freely offered at \$2 to \$2.25, and Foundry at \$2.50 a ton at oven. The output of Coke continues heavy, the Upper and Lower Connells-ville regions having turned out last week 373,372 tons.

Cleveland.

CLEVELAND, OHIO, May 15, 1906.

Iron Ore.—The movement of Iron Ore has been resumed, after a period of partial cessation, lasting about ten days. This came about as a result of the settlement in the middle of last week, in which the longshoremen waived any demand for recognition of the Mates' Union. The docks resumed activity on Thursday morning, pending a conference for the determination of hours and wages for the remainder of this year. At a meeting of longshoremen and dock managers, held Friday and Saturday, a contract was made for two years, the terms of which were that the men should be paid the same wages as last year, but should get a ten-hour instead of an eleven-hour day. Since most of the Ore is handled on a tonnage basis, this contract hardly changes conditions from a year ago. The fact that most of the upper lake docks have been running all during the strike caused a serious congestion of the boats at lower lake ports at the termination of the strike, and there is considerable difficulty at the present time in getting these boats unloaded and started back up the lake. This delay promises to reduce the amount of Ore moved in May, and practically offset the heavy movement in April. At the same time there has been enough Ore brought down the lakes to avoid any possibility of a shortage at the furnace during the remainder of the summer, and the situation in the Iron industry is, therefore, very much relieved. Most of the boats so far have been engaged in moving contract tonnage, but a number of wild charters have been made on the basis of 75c. from Duluth, 70c. from Marquette and 60c. from Escanaba.

Pig Iron.—While a good many furnaces have their output fairly well sold for the better part of the third quarter, a

great deal of buying is still going on, in lots ranging from 500 to 1000 tons, mostly for delivery during the remainder of the second quarter and through the third quarter. Some little, however, is being bought for fourth quarter delivery. Prices are unchanged, on the basis of \$16.50 for No. 2 Foundry at furnace. Basic Iron is quiet just now at \$17 in the valleys. Moderate buying is seen and shipments from the furnaces continue heavy. The demand is especially strong for Bessemer Iron, since the supply of steel is short, and every effort is being made to meet the demand of the market. The market is firm at \$17.25 to \$17.50. Southern furnaces are holding at \$14, Birmingham, to which is to be added a freight rate of \$4.10 to Cleveland.

Finished Iron and Steel.—The extreme shortage of Sheet Bars and Billets is at present a ruling factor in the Finished Material market in this territory. The effect is being seen principally in the Sheet trade. Some of the smaller mills have been selling their Sheet Bars rather than converting them into Sheets. Reports are current that a number of the Sheet mills have been compelled to shut down on account of the shortage of Sheet Bars. The result is that the Sheet situation is stronger than it has been for a year, and there is talk of higher prices. For the present, however, stock prices remain at 2.15c. for No. 10 Black, 2.70c. for No. 28, one pass cold rolled, and 3.70c. for No. 28 Galvanized. The big Bar tonnage placed by agricultural concerns leaves the mills in a strong position for the remainder of the year. Many of the Bar consumers throughout northern Ohio are buying freely on the basis of 1.50c., Pittsburgh, for both Bessemer and Open Hearth Bars. The Bar Iron situation is easy, partly due to light buying and partly to cheaper Scrap. Reports are coming in of new contracts being placed on Structural Shapes for delivery the last half of the year, and Steel mill men report that the business will be heavier for the last half of the year than it was for the first half. Heavy buying by the car builders and boiler makers throughout this territory has strengthened the Plate situation. Universal Plates are extremely scarce, although Sheared Plates are a little easier. There is a good demand for Steel Rails from the traction companies, and a big tonnage is expected to be closed in the near future. A number of such lines are building extensions this summer, and one enterprise alone will mean the construction of about 50 miles of new line.

Old Material.—The buying of Scrap shows some improvement, due to the fact that some users of Billets are now using Scrap for making Iron Axles, to take the place of Steel Axles, which could not be made at a profit owing to the high price of Forging Billets. This is increasing the demand and comes in addition to the heavy buying by the mills for the manufacture of Bar Iron. Prices continue as they have been, but weaker, as follows, f.o.b. Cleveland, gross tons: Old Steel Rails, \$14.50 to \$15.50; Old Iron Rails, \$22 to \$23; Iron Car Axles, \$18.50 to \$19.50; Heavy Melting Steel, \$14.50 to \$15. Net tons: Cast Borings, \$8.50 to \$9; No. 1 Busheling, \$12.50 to \$13; No. 1 Railroad Wrought, \$15 to \$16; No. 1 Cast, \$13.50 to \$14.50; Stove Plate, \$10.50 to \$11; Iron and Steel Turnings and Drillings, \$9.50 to \$10.50.

Birmingham.

BIRMINGHAM, ALA., May 14, 1906.

Pig Iron.—The market has been steady, though not very active this week. Some of the furnaces report good sales, but others say it has been just a little more quiet than usual. The price of \$14 for No. 2 Foundry is being maintained regardless of concessions made by certain Northern furnaces, the Southern producers having their output practically all booked to July and sufficient orders for delivery during the second half to warrant a feeling of confidence on their part. Then, too, shipments are keeping pace with production, and the many requests received to anticipate shipments are sufficient to create an optimistic feeling among the furnace people, who feel that even though the production for the year may reach the 25,000,000 mark the consumption will be fully as great.

Three of the Tennessee Company's furnaces at Bessemer have been out of blast this week undergoing minor repairs, but will be started again within the next few days.

Cast Iron Pipe.—The American Cast Iron Pipe Company made its first cast Saturday, the new equipment proving in every way satisfactory. The company is starting out with its order book well filled, and, being managed by experienced people and backed by ample capital, its success from the start is assured. All Pipe foundries in the district report all the orders they can handle, and more Cast Iron Pipe is now being sent out of this territory than ever before.

The Universal Pipe made by the Central Foundry Company at its Bessemer plant is in great demand. Large quantities of this Pipe have been recently used in California and reports received since the earthquake are to the effect that it stood the severe test without a leak, in one instance saving an entire city from destruction by fire, the old style Pipe in this place going to pieces, but the Universal remaining intact.

The Cast Iron Soil Pipe market is becoming very active, and prices were recently advanced about 10 per cent. The building operations planned for the year will, it is estimated, tax the foundries to their full capacity. On account of the mild winter building operations have continued without interruption throughout the country, in consequence of which Soil Pipe manufacturers have been unable to accumulate any stocks and are from 30 to 60 days behind in their deliveries.

Old Material.—The Scrap market has been fairly active this week, with a few nice orders reported. Full stocks are being carried and dealers are quoting approximately as follows per gross ton, f.o.b. cars here:

Old Iron Rails.....	\$17.25 to \$18.25
Old Iron Axles.....	18.25 to 18.75
Old Steel Axles.....	16.25 to 17.25
Old Car Wheels.....	16.25 to 16.75
No. 1 Railroad Wrought.....	15.25 to 15.75
No. 2 Railroad Wrought.....	14.75 to 15.25
No. 1 Country Wrought.....	13.75 to 14.25
No. 2 Country Wrought.....	11.75 to 12.25
Wrought Pipe and Flues.....	11.75 to 12.25
Railroad Malleable.....	11.75 to 12.25
Mixed Steel.....	9.75 to 10.25
No. 1 Machinery Cast.....	11.25 to 11.75
Stove Plates and Light Cast.....	9.25 to 9.75

In addition to the changes in the New York sales office of the Tennessee Coal, Iron & Railroad Company and the Republic Iron & Steel Company, a number of other consolidation changes have become effective. At Chicago the offices of the Tennessee Company in the Rookery have been abandoned and James E. Hubbert, Western sales manager of the Republic Company, will hereafter have direct charge of the sale of Tennessee Pig Iron, Rails and other products, with A. H. Carpenter, formerly Chicago manager, as his assistant. At St. Louis Dwight C. Guthrie will be manager of sales and N. C. Durie assistant. At Cleveland C. T. Johnson, sales manager for the Republic, will look after the interests of both companies, with George D. Evans as assistant. At Cincinnati M. E. McKee will be manager of sales for both companies, and Willard Wilson, who has represented the Tennessee Company there, will return to Birmingham as assistant general manager of sales for that company. It is understood that the territories of each of the sales agencies will be continued on the lines heretofore prescribed by the Republic Company.

The Wire and Nail mill of the Southern Steel company at Ensley, which was damaged by fire several weeks since, is again in operation. Extensive improvements have been made and its capacity largely increased.

The Scotch Iron Market.

GLASGOW, May 4, 1906.

Our Iron market has been very animated since the San Francisco calamity, which has evoked the deepest sympathy here. Previously Iron warrants had begun to stiffen on the reports of the threatening aspect of affairs in American Coal fields, from which it came to be speculatively inferred that if any American blast furnaces were compelled to blow out for want of fuel the long expected orders for Cleveland Iron would at last find their way across here. It did not seem to occur to those who speculated on this idea that America could import fuel as well as Pig Iron, if need be, and would probably prefer to keep its furnaces going with imported fuel than feed its mills with imported Pig Iron. Then came a Reuter's cablegram from Pittsburgh to the effect that more Steel would be required for the building of San Francisco than American mills would be able to supply, and that consequently large orders would have to be sent to Great Britain and Germany. In the Pig Iron market the dominant feeling for the moment became that America would import Pig Iron from us to the necessary extent to increase the product of her Steel mills for the requirements of San Francisco. And then came orders to hurry forward shipments of Pig Iron to San Francisco that had been purchased before the earthquake in the ordinary course of business.

The bull was in the ring once more and Cleveland warrants, which recently were down to about 47s., rapidly mounted to 51s., while Cumberland Hematite warrants climbed to 66s. After that the market got a setback on the publication of a cabled portion of *The Iron Age's* summary of the situation and the estimate of the capacity of the American mills to meet the emergency without extraordinary effort. Prices then dropped again, and Cleveclands are now not worth more than 49s. and Cumberland Hematite 63s. to 63s. 6d. The daily fluctuations, though not large, now show great restlessness in the warrant market, and some operators adhere to the opinion that the duty on Pig Iron to be used for the manufacture of material for San Francisco will have to be rebated by Congress. The wish is father to the thought in this case, no doubt. But if American manufacturers do require crude material from us to help them over a time of excessive pressure (if it comes), we have only about 80,000 tons of Hematite (Bessemer) Pig Iron in public stores and it is not thought that makers have more than a few thousand tons in their yards. Of Cleveland Foundry Iron there are now 662,500 tons in warrant stores,

and it certainly would be a blessing to the market if America could use up that for San Francisco or elsewhere. Last month that stock was reduced by 17,640 tons, and on May 1 there were warrants for 661,400 tons in circulation. There were also in the Middlesbro warrant stores 36,688 tons of Standard Foundry Iron, with warrants on circulation for 28,000 tons; in the Glasgow stores 12,630 tons of G. M. B., with warrants in circulation for 12,150 tons, and 6650 tons of English Standard Foundry Iron, with warrants in circulation for 6000 tons. The total stocks of Pig Iron in all the public stores of the United Kingdom April 30 were 798,947 tons, as against 787,474 tons December 31, 1905, and 218,158 tons December 31, 1904.

Scotch Hematite is 70s. and Middlesbro mixed numbers 67s. 6d., delivered to Steel works. Makers now ask for Cleveland No. 3 6d. per ton over warrants, 51s. 9d. for No. 1, 49s. 6d. for No. 4 Foundry, 49s. for No. 4 Forge. The shipments are increasing and are coming up to record totals. The fact is that not only is Germany now a large buyer, in spite of the reductions made in German Iron by the syndicated makers, but other foreign countries are also buying freely. The market is ripe for a rise in spite of the stocks, if any orders be sent over from America. But in Scotland the Iron and Steel manufacturers are not so pressed as they were. Most of them have pretty full order books and are busily engaged on contracts (especially for shipbuilding material), but they are not booking much new business. Shapes, &c., for building purposes could now be obtained here on lower terms than two or three months ago, but so far no inquiries have been reported from America.

The Scotch shipbuilding yards have turned out quite a large amount of work in the third of the year now expired. In the four months ending April 30 113 vessels were launched of 177,267 gross tons. This is 22 vessels and 21,140 tons more than in the corresponding portion of 1905, and it is the largest total on record for the first four months of any commercial year.

The German Iron Market.

BERLIN, May 3, 1906.

During the past few weeks the evidence favorable to an optimistic view of the iron situation has gained perceptibly in strength. Prices have everywhere been maintained, and in the open market there has been an advance of 5 marks in Plates. Sheet mills last week voted to make 135 marks their bottom price. In some forms of finished goods, too, manufacturers report an improvement in prices.

The Steel Syndicate's Operations.

The Steel Verband's shipments for March broke all previous records. The movement in Group A products (Railroad and Structural Materials and half finished Steel) reached 527,857 metric tons, as compared with 437,559 tons in February and 470,924 tons in March, 1905. Shipments for the month were nearly 21 per cent. in excess of the allotments. For the business year ended March 31 the Verband's shipments of these classes of goods increased by 889,756 tons, or almost 19½ per cent.

The Verband gives the following summary of the situation, in connection with its March report: "Since sales for the third quarter were declared open last month, a large part of the requirements for that quarter has already been ordered. From foreign countries, where recently a somewhat quieter tone had prevailed, inquiries are again coming in, and indeed for delivery as far off as into the fourth quarter of the year. In railroad Steel the amount of orders on hand is very heavy; the quantities to be delivered during the current quarter are far in excess of the allotments. Calls for Heavy Rails previously ordered are very brisk, chiefly in consequence of the heavy demands of the Prussian railroads. Home business in Structural Shapes is opening up well; the volume of specifications coming in is quite large. Foreign business in Structural Material is satisfactory; but there is a quieter tone in new business, inasmuch as the requirements for the first half year have generally been met. Calls for goods already ordered are very urgent, from which it may be concluded that no slowing up in requirements has occurred, and that prices will continue to develop favorably."

The Verband's business in other forms of goods has continued to develop so well that a further increase in allotments became necessary last week. In Bars, Plates and Pipes the increase is 4½ per cent., and in Rolled Wire 5½ per cent. These goods had been marked up 5 and 10 per cent., respectively, at the end of January; but attempts were made already in February, and again in March, to put through further increases. The Verband rejected proposals to that effect March 22, but the extraordinary volume of orders in the market has at last induced it to satisfy the pressing demands for another increase. It is regarded, too, as only a question of time how long the Verband can stave off a further enlargement of allotments in half Rolled Steel forms under Group A (Billets, Blooms, Ingots, &c.). Consumers of such materials are complaining that they are scarce, and the delays in delivering on orders are growing more and more troublesome.

The Situation in the Pig Iron Market

has undergone considerable improvement within a fortnight. Several weeks ago the Iron famine was declared to be at an end, owing to the fact that consumption had become restricted in the metal trades by a number of strikes or lock-outs. Although these have not been settled the demand for Pig has latterly increased; the furnaces are not able to deliver as fast as called for, and are compelled to ask for an extension of time. An Essen dispatch of to-day states that in the Siegen district full work for the furnaces is already assured to the end of the September quarter. Delivery upon American orders recently contracted extend into that quarter. The Siegen Syndicate continues selling Spiegeleisen in England within 2 marks of the home price, which is looked upon as strong evidence of the bull conditions prevailing in the world's markets, inasmuch as German Spiegeleisen has risen relatively more than any other grades. Ores continue scarce; the Siegen mines have sold nine months in advance. Rolling mills in that region also are supplied with orders far ahead, and new orders for early delivery are only taken at higher prices. Other reports on the general Pig Iron situation are even more optimistic, declaring that no further orders can be satisfied for the second half of the year. Additional furnaces are being blown in, but not in sufficient numbers to materially relieve the pressure for Iron.

The San Francisco Wire,

together with the prospective removal of duties for a year on building materials for that city, awakened hopes in Germany that much German Structural Steel would be demanded for export there; but the summary of *The Iron Age's* weekly review of the market cabled last week tended rather to put a damper upon those hopes. Nevertheless, the market for Iron shares remains very strong, the improvement in the American situation being interpreted as a bull factor. The latest price advances reported from New York have added materially to the bullish tendency here. Another favorable factor is the last quarterly report of the United States Steel Corporation, which made an excellent impression on the German stock markets.

As mentioned above, a number of strikes are now in progress in the metal trades. These are confined chiefly to Dresden, Hanover, Brunswick, Berlin and Frankfort-on-the-main; but there are indications that they may spread to other centers.

The Coal Trade.

The Coal Syndicate has just decided to discontinue the payment of an export drawback on Coal used in manufacturing Iron for the foreign market. The bounty is 5 marks a ton of exported Iron or Steel, and it is to be discontinued with the beginning of the next quarter. The reason assigned by the syndicate for its action is the present excellent condition of the Iron market and the profitable basis of prices therein. The discontinuance of the bounty causes much regret in the Steel Verband.

The Coal industry is still in a process of expansion. The Essen district is being steadily pushed northward, where borings during the past few years have proved the existence of valuable deposits. On this northern fringe of the Essen district not less than two dozen new shafts are being sunk. On the Saar the Prussian Government intends to enlarge its mining plants; and much new Coal territory will be opened up soon in Lorraine. A great company, made up of German and French capitalists, has acquired a very large property near the French frontier, and will proceed at once to develop it. Other development work on a large scale is going on there.

Much work for adding to the Coke production of the country also is in progress. In the Essen region alone it is estimated that nearly 1000 Coke ovens are either in construction, or have been very recently completed. Some of these replace old ovens not fitted for saving the by-products. All these new ovens are so fitted up, and there is a rapid increase in the number of benzine factories.

The molders employed in the union shops of the Pittsburgh district have made a demand for an increase in wages from \$3.30 to \$3.50 per day minimum and a nine-hour day. This demand was submitted to the employers last week who are members of the Manufacturers' Association of Pittsburgh and was refused. A strike has not yet been declared, the molders continuing at work pending the arrival of President Valentine. If a strike is started it will involve the open shop issue, as the employers in Pittsburgh, who are members of the National Founders' Association, have declared their intention not to sign contracts with the iron molders' union. If a strike is declared it will involve about 1200 molders in the Pittsburgh district.

New York.

NEW YORK, May 15, 1906.

Pig Iron.—A number of good sized orders have been placed, among them one lot of about 5000 tons of Foundry Iron, for delivery during the balance of the year to a Connecticut foundry. There has also been sold a 5000-ton lot to a radiator manufacturer in the Buffalo district. Other large orders, for instance that of the General Electric Company, have not yet been closed. There are a number of good sized inquiries. We continue to quote No. 1 Foundry, \$18.50 to \$19; No. 2 Foundry, \$18 to \$18.50; No. 2 Plain, \$17.50 to \$18. Southern Iron is quoted at \$18.25 to \$18.50 for No. 1 Foundry, and \$17.25 to \$18 for No. 2 Foundry.

Steel Rails.—While the Rail mills are not yet ready to say that their capacity for 1906 product has been strained to the breaking point, the very late deliveries which railroads must now accept on 1906 orders are limiting the business under discussion for this year. In the past week the Chesapeake & Ohio has ordered 15,000 tons additional for 1906, and other orders for this year include 6000 tons for the Oneida Railway Company, 6200 tons for the Baton Rouge, Hammond & Eastern, and 5500 tons for the Nickel Plate. The Wisconsin Central has contracted for 5000 tons for next year and the Wabash for 10,000 tons. In several cases large reservations by important systems are pending. The Light Rail trade is still very heavy, with the demand exceeding the capacity of the mills.

Structural Steel.—It has been rather a light week in respect to new business, the largest contracts being those of the Lake Shore Railroad for its Franklin & Clearfield division, of which 2700 tons went to the King Bridge Company, Cleveland, Ohio. The American Bridge Company took 350 tons in addition to larger contracts placed some time ago for this same division. The Baltimore & Ohio has placed 2000 tons of bridge work with the McClintic-Marshall Construction Company. Bridge business under negotiation includes 4000 tons and upward for the Chicago & Northwestern. Construction of cement plants is going on at a record rate, though in many cases cheaper construction than Steel is adopted for temporary purposes. For the Western Portland Cement Company a plant is to be built in Kansas, requiring 1200 tons of Steel. The American Bridge Company took this contract. It also has the Racquet Club building in Philadelphia, 600 tons. Among projected work in New York, on which Structural mills have been asked to bid, is the Steel for a new foundry for R. Hoe & Co., at Tompkins and Broome streets. Milliken Brothers have the contract for the first building to be erected by the Proctor & Gamble Company on Staten Island. The site adjoins that of the Milliken Brothers' Steel plant on the west. About 2000 tons of Steel will be needed for this first construction and more will be required for later buildings. Milliken Brothers have taken some further sugar mill work for Mexico. The buildings will require about 300 tons of Steel and a large operation will be carried on. The builders are the Badger Mexican Planters' Company, and the mill is located in Vera Cruz. Local fabricating firms do not look for any particular demand on account of San Francisco rebuilding for some months. It may be toward the end of the year before much business is done. Financial arrangements will take time, and there are some street and real estate adjustments that may be a matter of months. The consumption of Structural Steel in tall buildings in San Francisco has rarely exceeded 25,000 tons for any recent year, and as it is only occasionally that more than 2500 tons have been required for a single building, it can be seen that the expectations even yet entertained in some quarters as to probable demands upon Steel works for new building at San Francisco are very much too high. We quote as follows on mill shipments for tidewater deliveries: Beams, Channels, Angles and Zees, 1.84½c.; Tees, 1.89½c.; Bulb Angles and Deck Beams, 1.99½c. Beams, 18 to 24 inch, 0.10c. extra; Angles over 6 inches, 0.10c. extra. Out of stock Beams and Channels are sold at 2.50c. to 2.75c.

Bars.—Sales agents report a fair volume of business in both Iron and Steel Bars. Prices are unchanged, at 1.64½c. to 1.74½c., tidewater, according to deliveries and specifications.

Plates.—New business in this vicinity continues very dull. The Eastern mills are, nevertheless, well supplied with work and no indications appear of any weakness in prices. Quotations are as follows at tidewater: Sheared Tank Plates, 1.74½c. to 1.84½c.; Flange Plates, 1.84½c. to 1.94½c.; Marine Plates, 2.14½c. to 2.24½c.; Fire Box Plates, 2.24½c. to 2.60c., according to specifications.

Cast Iron Pipe.—Manufacturers report a condition of activity which surpasses anything previously known. The volume of business now coming in is extraordinary, although it consists generally of small quantities. Consumption is evidently proceeding on an increasing scale. The old foundries are so crowded with work that new companies now starting in business are finding their order books rapidly filling up. Prices are firm, carload lots of 6-inch being still quoted at \$30.50 per net ton at tidewater.

Old Material.—Relaying Rails continue to be one of the strongest features of the market. The demand is very strong, particularly for standard sections. Cast Iron Scrap, Stove Plate, Wrought Pipe, Iron Axles and Iron Rails are all in good demand. Malleable Scrap is particularly strong. Wrought Scrap and Steel are quiet, from the standpoint of dealers, but rolling mills and steel companies which have claimed to be out of the market have recently bought very freely directly from railroad companies, taking the greater portion of materials offered in recent lists. While the market on Rolling Mill stock and Steel Scrap is not strong, dealers are not disposed to sacrifice what they have on hand, as they are quite confident of the future. Approximate prices per gross ton for New York and vicinity are as follows:

Old Iron Rails.....	\$20.50 to \$21.50
Relaying Rails.....	25.50 to 26.00
Old Steel Rails, rerolling lengths.....	16.50 to 17.50
Old Steel Rails, short pieces.....	15.50 to 16.00
Heavy Melting Steel Scrap.....	15.50 to 16.00
Standard Hammered Iron Car Axles.....	25.00 to 26.00
Old Steel Car Axles.....	20.00 to 21.00
No. 1 Railroad Wrought.....	19.00 to 20.00
Iron Track Scrap.....	16.50 to 17.50
No. 1 Yard Wrought, long.....	17.50 to 18.00
No. 1 Yard Wrought, short.....	15.50 to 16.00
Wrought Pipe.....	14.00 to 14.50
Light Iron.....	10.00 to 10.50
Cast Borings.....	9.00 to 9.50
Wrought Turnings.....	12.50 to 13.50
Old Car Wheels.....	17.00 to 18.00
No. 1 Machinery Cast.....	15.50 to 16.00
Stove Plate.....	11.50 to 12.00
Grate Bars.....	10.50 to 11.00
Malleable Cast.....	16.50 to 17.50

Metal Market.

NEW YORK, May 16, 1906.

Pig Tin.—The market is so wild and erratic, with two or three quotations made the same hour for identical deliveries, that it is impossible to make an exact quotation. In a general way it may be said that Tin can be obtained between 49c. and 50c. This is not for spot, however, which continues almost unobtainable. In fact, there is little Tin for sale out of the steamer Mesaba, which reached her dock this morning with 640 tons; this Tin will be available Friday. There is little metal offering from the Minneapolis, which is scheduled to arrive the 21st with 545 tons. It is understood that a goodly proportion of this metal is for the principal manufacturer of Tin Plate. The week's advance from 43.50c. to 49.50c. is the sharpest ever known, as is also the advance of £11 in London on Monday. Consumers, being bare of stocks and fearful of higher prices, have bought largely, some for delivery three months hence. Dealers are afraid of importing at these high prices; consequently the premium above London parity is being maintained. The trading in futures on the London Exchange has been very heavy. To-day's prices in London are weak at £207 10s. for spot and £200 for futures, spot being £7 10s. below the high price of Monday. The arrivals so far this month aggregate 1877 tons, and there are afloat 1065 tons.

Copper.—The market is exceedingly strong, and for deliveries during the last half of the year 18.62½c. to 18.75c. are quoted for Lake, 18.50c. to 18.75c. for Electrolytic and 18.12½c. to 18.37½c. for Casting grades. For nearby deliveries probably ½c. to ¼c. above these prices would be demanded, according to the urgency of requirements and date of deliveries. Copper for May and June shipments is scarce, especially Electrolytic. It is well known that consumers in Europe are taking Copper in large quantities, as is brought out by the complete returns for April exports, which were 16,330 tons. The exports so far this month are large, aggregating 9712 tons. A leading railroad, which stopped letting contracts six weeks ago because of the coal strike, has during the last week let over \$1,000,000 worth of new construction, a large part of which will call for Copper Wire and Rail Bonds. Those well conversant with the situation express considerable surprise at the strength of the market for later deliveries. To-day's London market closes at £86 5s. for spot and £85 12s. 6d. for futures, with Best Selected held at £91; higher prices have been paid for the latter.

Pig Lead.—Prices are decidedly firmer, dealers in this city holding spot at 6c. The metal is very scarce and there are prospects of even higher prices. In St. Louis the market is firmer at 5.87½c. bid. The principal producer's price to-day, governing old contracts, is 5.87½c. Future orders are taken only at the price current on date of shipment. The London market advanced sharply to-day to £17 7s. 6d. About 200 tons of Lead have been bought in Europe to be exported to this country.

Spelter.—Prices are lower and the demand is light. Spot offerings are made on a basis of 5.90c. to 6c. In St. Louis the market is easy at 5.85c. asked. The London market is a trifle higher at £26 12s. 6d.

Aluminum.—The principal producer is still considerably behind on shipments and does not fill orders with any degree of regularity. For No. 1 Ingots 35c. is quoted; for No. 2, 32c.

Antimony.—Again higher prices are the rule, and although there is some irregularity Cookson's and Hallett's are generally quoted at 26½c. to 27½c.; other grades at 25½c. to 26½c. The market seems to be in a fair way to reach still higher levels.

Quicksilver.—Prices are steady, dealers holding flasks of 75 lbs. in 100-flask lots at \$41 per flask. The London market is steady, Rothschilds quoting £7 5s.

Nickel.—Is purely nominal, large lots being quoted at 40c. to 45c.; smaller quantities at 50c. to 60c.

Tin Plate.—Although there is every prospect of an advance, due to the high price of Pig Tin, still manufacturers are selling 100-lb. Bessemer Coke Plates at \$3.60, f.o.b. Pittsburgh, and \$3.79, f.o.b. New York. In Swansea prices have advanced 1s., to 14s. per box, due to the price of Pig Tin.

Old Metals.—Dealers in all classes of Scrap are holding prices firmer, and quotations on Old Copper are firmer. Brass Scrap is also higher, as is the case with Old Lead. Scrap Aluminum is eagerly sought for by both dealers and consumers. Dealers' selling prices are as follows:

	Cents.
Copper, Heavy Cut and Crucible.....	18.00 to 18.25
Copper, Heavy and Wire.....	17.75 to 18.00
Copper, Light and Bottoms.....	16.00 to 16.25
Brass, Heavy.....	12.50 to 12.75
Brass, Light.....	10.50 to 10.75
Heavy Machine Composition.....	16.50 to 17.00
Clean Brass Turnings.....	11.50 to 11.75
Composition Turnings.....	13.50 to 14.00
Aluminum Scrap.....	26.00 to 28.00
Lead, Heavy.....	5.45 to 5.60
Tea Lead.....	5.20 to 5.35
Zinc Scrap.....	4.90 to 5.00

Iron and Industrial Stocks.

NEW YORK, May 16, 1906.

The market continued its recovery during the period embraced since our last week's report, and prices of iron and steel stocks may now be said to be in a normal condition. The advances made in some cases were quite considerable. Can preferred moved up from 61¼ to 65, Locomotive common from 61¼ to 68¾ and Tennessee Coal from 145¼ to 148. Fluctuations in other active stocks have been as follows: Car & Foundry common 39¼ to 42, Colorado Fuel 50¼ to 52½, Pressed Steel common 50½ to 51¼, Railway Spring common 52, Republic common 27½ to 29¼, preferred 100 to 103; Sloss-Sheffield common 76½ to 79¼; Cast Iron Pipe common 48 to 49½, ex-dividend, preferred 90½ to 93½; Steel common 40½ to 42, preferred 105¼ to 106¾. The market was less active on Tuesday and some recessions occurred. Last transactions up to 1.30 p.m. to-day are reported at the following prices: Can common 8½, preferred 64¼; Car & Foundry common 41¼, preferred 102¾; Locomotive common 67¼, preferred 114½; Steel Foundries common 11½, preferred 45; Colorado Fuel 50¾; Pressed Steel common 51, preferred 97¾; Railway Spring common 52¼; Republic common 28¾, preferred 101¾; Sloss-Sheffield common 79; Tennessee Coal 147½; United States Cast Iron Pipe common 48¾, preferred 93½; United States Steel common 41¼, preferred 105½.

Director W. Wilson Smith of the Lake Superior Corporation, who leaves for England shortly in connection with the bond issue proposed by the company, is quoted by the Philadelphia *Ledger* as follows: "The total first mortgage and collateral trust bonds amount to \$10,000,000, bearing interest at 5 per cent. About \$1,800,000 of the bonds remain in the treasury to meet future requirements. As the net earnings for the fiscal year ending June 30 next will total between \$1,200,000 and \$1,250,000, they will represent about two and one-half times the interest on these first mortgage collateral trust bonds. There are income bonds behind these of about \$3,000,000, for which par was paid. The total assets of the corporation, according to the books, now amount to over \$53,000,000."

Robert W. Coates, formerly superintendent of Etna Furnace at New Castle, Pa., and Hall Furnace at Sharon, Pa., of the Republic Iron & Steel Company, has resigned and has been made general manager of the Blast Furnace Company at Sharpsville, Pa. The latter has recently been granted a Pennsylvania charter and expects to start its blast furnace before July 1. The stack has been idle for several years and will be operated on Bessemer iron, making about 200 tons per day.

The plant of the Severance Mfg. Company, manufacturer of railroad spikes at Glassport, Pa., was burned last week. The plant will be rebuilt as rapidly as possible and probably on a larger scale.

R. S. Henderson of Sharon, Pa., has just returned from a trip to Europe.

New Publications.

The Morton Memorial Volume. Issued at Stevens Institute of Technology as a Memorial to Henry Morton. Edited by Franklin De Ronde Furman. Price, \$10.

Some years before his death, Henry Morton, president of Stevens Institute of Technology since its foundation, began the work of collecting the material for a history of the institute and of the engineering work of the Stevens family, the first plan for the book having been outlined in 1897 at the occasion of the twenty-fifth anniversary. After his death the Alumni Association of Stevens Institute decided to issue the book as a memorial volume. It was issued entirely on advance subscriptions, but a limited number of copies is now available to friends outside of the alumni.

The first section of the handsomely equipped work deals with the history of the institute, which was formally opened in September, 1871. Edwin A. Stevens, the founder, first contributed a block of land at Hoboken, a building fund of \$150,000 and an endowment fund of \$500,000. President Morton during his life added gifts aggregating \$145,000, while Andrew Carnegie in 1879 gave \$50,000 for an engineering laboratory and subsequently added \$125,000 for the endowment of the laboratory. Funds are being collected for the building of the Morton laboratory of chemistry. The original fund, \$60,000, was largely due to the benefactions of President Morton. The alumni have increased this to \$90,000, the ultimate sum aimed at being \$120,000. Thus the somewhat modest original equipment of the institute has been added to, corresponding in a measure with its steady growth in numbers of students and the development of its work.

To the engineer at large the most interesting part of the volume is the review of the engineering work of the Stevens family and of Col. John Stevens in particular. This section contains much original matter covering the early days of the steamboat. Colonel Stevens in 1798 had a steamboat on the Hudson nearly a decade before Fulton ran his Clermont, and six years later he equipped with double screws another predecessor of Fulton's craft. In 1811 he established the first steam ferry in the world, between Hoboken and New York, and in 1826 he built a steam locomotive with multitubular boiler, which he operated on a circular track built on his own property. He was then a man verging on his eightieth year. His son, Robert Livingston Stevens, who as a boy of 17 had assisted his father in 1804 in the construction of the screw steamboat, five years later took the sidewheel steamer *Phoenix* to Philadelphia, making the first sea trip of a steam propelled craft. Robert Stevens became a famous builder of steamships. He was a pioneer in railroad building, both as a financier and as an engineer, and during a trip to England in 1830 designed the T-rail. He and his brother, Edwin A. Stevens, became interested in war vessels, and in 1842 were voted \$250,000 for a shot proof steamer. They began work on what was known as the Stevens Battery, Robert L. Stevens resting from his labors in 1856. In 1861 Edwin S. and John C. Stevens offered to complete the battery at their own risk, an offer which was not accepted. Edwin A. Stevens bequeathed the vessel, with \$1,000,000, to the State of New Jersey. This sum was expended in 1869 and 1870. The vessel was not launched, and in 1881 she was wrecked after an effort had been made to effect a sale, Prof. R. H. Thurston being the consulting engineer of the commission.

The third section of the work is an admirable series of biographies of the trustees, faculty and alumni, with complete lists of the writings of the late Dr. Morton and of Profs. Alfred M. Mayer, R. H. Thurston, De Volson Wood, A. K. Leeds, J. E. Denton, D. S. Jacobus and others.

Principles of Roll Turning (Grundzuege der Walzenkalibrierung). By Emil Kirchberg. Published by Fr. Wilh. Ruhfus, Dortmund, Germany.

The literature of roll turning is so meager that a worthy addition to it is exceedingly welcome. Efforts have been made to substitute for the purely empirical methods some mathematical basis for determining the correct series of grooves. Mr. Kirchberg divides his

book into three sections, the first dealing with general considerations, the second with roll turning for bars, and the third for angles, beams, channels and rails. A series of sheets of full-sized reproductions of grooves for beams, channels and rails are appended. Taking it altogether the work, brief as it is, constitutes the best mathematical treatment of the subject, with thorough application of the practical points involved.

Trade Publications.

Structural Steel Shapes.—Jones & Laughlin Steel Company, Pittsburgh, Pa. 1906 list and diagrams of shapes. Leather bound; 4½ x 6½ inches; pages, 204. A revision of this company's well-known handbook of structural steel shapes. It gives all the data contained in previous editions, including lists of extras on plates, shapes, bars, &c., with full tables of weights and dimensions of Jones & Laughlin Steel Company beams, channels, T 8s and Z bars, squares, rounds and flats. Diagrams are given of shapes and special details of the Larimer column. There is an index at the end and a number of blank leaves for notation.

Oil Extractors.—Albert B. Curtis, 10 Loudon street, Worcester, Mass. Circular. Illustrates the Curtis oil extractor for separating oil from metal chips as they come from a screw machine, lathe or other machines where oil is used. It consists essentially of a power driven pan of ½-inch sheet steel, in which the chips are placed, the oil being thrown out of the pan by centrifugal force, while a cover retains the chips. The oil is caught in a retaining reservoir and is drained into a pail placed beneath the machine. The machine weighs about 400 pounds and occupies a floor space of about 18 x 24 inches. It is claimed that the saving of oil will pay for the cost of the machine in a short time.

The first steam turbine turned out complete from the Allis-Chalmers shops at Milwaukee, Wis., has been installed in the Kent avenue power house of the Brooklyn Rapid Transit Company, Brooklyn, N. Y. It is directly connected to a Bullock alternator of 5500 kw. rated capacity. The construction of the turbine needs no further discussion here, inasmuch as it was described in *The Iron Age* December 14, 1905, but a noteworthy fact in connection with this installation deserves mention. The turbine was ready for operation February 1, but owing to delays in work in other parts of the plant lay idle for about two months. Then unexpectedly it became necessary to put it into operation, due to a break down in another of the Transit Company's power houses. The representative of the builder was advised of the situation about 10 o'clock, and four hours later the machine was started up at full speed. Gradually it was brought up to a load of a little over 3000 kw. and tided over the period of shortage. After the emergency was over and the turbine was shut down it was examined and found to be in unusually excellent condition. Since then it has been operated almost continuously, most of the time at well above its rated capacity. The maximum loads carried at short times were 9000 and 9800 kw., the latter being 16 per cent. over the rated load.

Owing to scarcity of condensing water one of the stations of the Philadelphia Rapid Transit Company has always run noncondensing. The equipment consists of four 1500 horse-power Corliss engines and one of 2200 horse-power. An 800-kw. Curtis turbine generating set has been installed in conjunction with a cooling tower and operates at 1150 revolutions per minute. The four smaller reciprocating units furnish current of 575 volts to the extent of 2000 amperes each, while the turbine unit yields 1300 amperes without increasing the back pressure upon the engines. Of this 150 amperes are required for operating the rotary pumps for the cooling water, leaving 1150 amperes, or 57.5 per cent. of the output of one of the 1500 horse-power units, as the direct gain due to the turbine. The vacuum obtained is about 28 inches.

William Larimer Jones, general manager of the Jones & Laughlin Steel Company, Pittsburgh, has sailed for Europe.

The San Francisco offices of the United States Cast Iron Pipe Foundry Company are temporarily located at 951 Eddy street.

The Machinery Trade.

NEW YORK, May 16, 1906.

Many companies which have been holding back purchases of machine tools on account of the threatened disturbance have apparently come into the market for small lots of tools. While there were no large lists reported issued or closed the volume of both orders and inquiries was exceedingly large, covering mostly the medium and smaller sizes of tools. The increase of prices made at the Atlantic City convention has had no effect on trade, the delivery being more important than the price of a tool. This condition has led many companies to buy second-hand machines, who would buy new ones if they could get a reasonable delivery. While it is difficult to determine the amount of business being done in the general machinery line, that of a special class can be taken as an index to the flourishing condition of trade. It is stated that there has hardly ever been a greater demand for traveling cranes than at the present time, one company having received within the past few months inquiries aggregating \$200,000. The demand for air compressors is larger now than ever before. This is important, in view of the fact that the increase in air compressor capacity usually means the installation of additional machine tool equipment. The Chicago Pneumatic Tool Company has unfilled orders on its books for 69 air compressors, amounting to over \$100,000 in value. This company is rapidly constructing the addition to its Franklin plant, and will soon have a greatly increased output.

The Electric Properties Company, incorporated May 10, under the laws of New York, with a capital of \$6,000,000 preferred and \$6,000,000 common stock, has been organized to acquire, finance and develop properties, especially those in which electricity plays the principal part, such as power, electric traction and electric lighting enterprises, and to invest and deal in and to guarantee the securities of corporations operating such properties. It will also conduct, through Westinghouse, Church, Kerr & Co. (all of whose capital stock is owned by the new company), a general engineering and construction business. It may also issue collateral trust bonds secured by the pledge of securities acquired in the course of business. The purpose of the company, as mentioned above, will be mainly financial. It is not intended to make any changes in the organization or personnel of Westinghouse, Church, Kerr & Co., and Walter C. Kerr will remain president. One of the objects of the new company will be to co-operate with vested interests, such as railroads and other public service companies, in the development of properties for their account and, either temporarily or permanently, assist in financing such properties. John F. Wallace has been selected as president of the new corporation, and two vice-presidents will be elected at the first meeting of the directors. Among the directors of the new company are George C. Smith, vice-president of the Security Investment Company, and George Westinghouse, president of the Westinghouse Electric & Mfg. Company, Pittsburgh. The headquarters of the company will be in New York.

A list of tools and machinery has been issued by the purchasing department of the Pennsylvania Railroad Company, mostly for small tools of particular interest to the hardware trade. There are, however, some larger equipment, shown in the following list: One No. 4 pattern makers' lathe, iron bed, 18-inch swing, to turn 8 feet between centers, with motor attached, 110 volts, direct current; one 12 inch by 5 foot engine lathe, complete with large and small face plates, motor attached, 110 volts, direct current; one 11 inch by 4 foot bed speed lathe, complete with motor attached, 110 volts, direct current; one 24 x 24 inch by 6 foot stroke spur geared planer, complete with motor attached, 110 volts, direct current; one 16 inch by 8 foot bed cone head engine lathe, complete with large and small face plates, with motor attached, 110 volts, direct current; two 14 inch by 6 foot bed cone head engine lathes, complete with motors attached, 110 volts, direct current; two No. 2 power hack saws, with motor drive complete, 110 volts, direct current; one 75-lb. power hammer, with motor attached, 110 volts, direct current; two wood trimmers, complete with standards, knives and triangular gauges; two grindstone frames, with 40 x 6 inch stones, with motors attached, 110 volts, direct current; 12 manual training speed lathes, 12-inch swing, with iron bed, return 24 inches between centers, with motors attached, 110 volts, direct current; one band sawing machine, 36-inch metal wheels, five blades, one each $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$ and 1 inch, with motor attached, 110 volts, direct current; one saw bench, with saws for ripping, cross cut and mitering, &c., with motor attached, 110 volts, direct current; one 24-inch patent single surface planing machine, complete with motor attached, 110 volts, direct current; one 16-inch wet grinder, with emery wheel 16 inches in diameter by 2½ inch face, complete with motor attached, 110 volts, direct current; one No. 1½ universal milling machine, range 20 x 7 x 18 inches, complete with motor attached, 110 volts, direct current; one No. 1 universal cutter and tool grinder, complete with motor attached, 110 volts, direct current;

one 21-inch upright drill press, complete with back gears, power feed wheel and lever feed, automatic stop and adjustable head, with motor attached, 110 volts, direct current; one 16-inch back geared crank shaper, complete with swivel vise, table support and wrenches, with motor attached, 110 volts, direct current.

The Intercolonial Railroad has closed for a tract of land at Moncton, N. B., one-third of a mile wide and 1¼ miles long, as a site for its proposed new shops. The company has long contemplated the erection of new shops at that point, and is now preparing the plans.

The American Locomotive Company is planning extensive additions to its Canadian plant, which when completed will have cost close to \$1,000,000. The company also intends to enlarge its plants in this country, and will no doubt come into the market this year for a large amount of new machinery.

The Kennedy Valve Mfg. Company, New York, is asking bids for some machinery, principally cranes, for its new plant at Elmira, N. Y., to which city it will eventually move its plant from Coxsackie, N. Y. The plant will be moved by departments, as the new buildings are erected.

Bids were opened last week on two additional contracts for work on the Erie Barge Canal. It will be some time before the awards can be made, as intricate computations are necessary to determine the lowest bidders.

The United States Bag Frame Company, Newark, N. J., recently incorporated, has leased the bag frame factory at 269-275 Broome street from the William Roemer Company, and will purchase additional machinery to increase the output. The company manufactures frames, locks and trimmings for traveling bags, satchels and dress suit cases. James L. Mason is president; August E. Roemer, vice-president; I. J. Kauffherr, secretary, and William Roemer, Jr., treasurer.

Dodge & Day, engineers, Philadelphia, Pa., have been commissioned by the Kerr-Murray Mfg. Company, Fort Wayne, Ind., manufacturer of gas works machinery, to design, erect and equip a new plant, as the company's present facilities are entirely too small. Dodge & Day will probably purchase the machinery in the East.

The Public Buildings Trustees, Albany, N. Y., have taken action whereby bids are to be submitted for a capitol electric light plant. About \$60,000 is available for the work.

Catalogues Wanted.—As the catalogue files of the Moore & Scott Iron Works, San Francisco, Cal., were destroyed in the recent conflagration, the company will be pleased to receive new catalogues.

Chicago Machinery Market.

CHICAGO, ILL., May 15, 1906.

All of the large railroad lists of machine tools and equipment that were promulgated earlier in the year have now been placed, and manufacturers and dealers report a falling off in complete shop equipments. New shops that are being figured on by Western roads will require a large amount of machinery, but it is doubtful if specifications will be available before September. The advance of 5 per cent. announced by the makers of lathes, planers and shapers will not, it is believed, defer the placing of orders to any large extent, as the increased prices asked by the machine tool builders are extremely conservative considering the increased cost of raw materials. The Berlin Machine Company, Beloit, Wis., figured as the largest purchaser of the week, having placed orders with local dealers for approximately \$8000 worth of tools. Purchases include four planers, 20, 36, 42 and 48 inches respectively; 4-foot radial drill axle lathe and seven small drills. This company manufactures an extensive line of wood working tools and has just completed extensions to its pattern and machine shops, made necessary through the increased demand for its line. The Allis-Chalmers Company is also purchasing large tools for its Milwaukee shops. The floors of local dealers are barren of new tools, and as the manufacturers are not in a position to make deliveries in less than three months, and in many cases six months are required, there is little hope of replenishing stocks in the immediate future. The demand for second-hand tools has improved materially and large sales are being made to industrial plants unable to wait for manufacturers' deliveries. The strike of the members of the Safe and Machinery Movers' and Riggers' Union has put a stoppage to deliveries to local plants, although dealers' and manufacturers' representatives are enabled to make deliveries to freight houses with police protection. The men are demanding 50 cents an hour and an eight-hour day, as against 35 cents an hour with a ten-hour day, and double time after 5 o'clock. The contractors employing these men report that they are making favorable progress and believe that the strike will be broken soon, but in the meantime trade is being interfered with to a very great extent.

The Moline Plow Company, Moline, Ill., has actively begun to carry out its plans for extensive improvements, the first of which is the erection of a new wood shop department, which will relieve the main plant of all wood work. This building will be 120 x 183 feet, one story and basement.

Adjoining it will be a building for storing finished work, 27 x 70 feet, having a 50-foot shipping platform, and adjoining the storage building will be erected a boiler house, 20 x 40 feet, and a dry kiln, 30 x 72 feet. In addition to the equipment to be moved from the main plant, where all wood working has been done heretofore, the company will install a new four-side sticker, two double cut off saws, one multiple boring machine and a complete outfit of machinery for making plow handles. There will also be required two 100 and one 75 horse-power induction motors and a 100 horse-power tubular boiler.

The Paxton & Vierling Iron Works, Omaha, Neb., manufacturer of structural and ornamental iron and steel, has purchased about 1½ acres of ground adjoining its present plant and contemplates erecting a modern plant for manufacturing structural steel for buildings, bridges, &c. The property will not be vacated by the previous owner until June 1, and the Paxton & Vierling Company does not expect to proceed with the proposed improvements until the spring of 1907, when a \$100,000 plant will be erected. It will be similar in construction to the one now occupied and about the same size, or 60 x 200 feet, and will therefore double the output. The addition lies between the Union Pacific and the Chicago, Burlington & Quincy railroads, and will afford switching facilities for about 25 additional cars. The company has recently purchased a new Pels shears and electrical machinery for its present plant. Large contracts have been secured which will keep the plant running full capacity during the present year. Extensive improvements are being undertaken in Omaha and the surrounding territory, and it is to provide facilities for handling the increased building and bridge work that the company is enlarging its works.

The Weller Mfg. Company, manufacturer of elevating, conveying and power transmitting machinery, Chicago, is about to erect an extension to its plant in the shape of a two-story building, 49 x 175 feet. The company will make in its own plant the necessary equipment for this building.

The Fred. W. Wolf Company, Chicago, is in the market for 4, 6 and 10 foot boring mills and a 4-foot planer, either new or second hand.

The Anderson Engine Company, Shelbyville, Ill., is in the market for a number of machine tools, including lathes, planers, milling machine, drill presses, shaper and boring mill.

Cartier, Chapman & Co., Ludington, Mich., manufacturers of sleighs, vehicles, &c., have begun work on an enlargement to their factory, consisting of a main building, 60 x 160 feet, two stories high, and a blacksmith shop, 50 x 50 feet. Equipment for the addition has been partially secured, although there are still some items yet to be purchased. The improvements have been made necessary by the growing demand for the company's auto-sleigh and other products.

The Similkameen Falls Power & Development Company, Oroville, Wash., has begun construction work on a 1000 horse-power electric power plant at Similkameen Falls. The company solicits quotations on small motors of 5, 10, 20 and 25 horse-power. H. W. Johnson is manager.

Announcement has been made of the transfer of the plant and other assets of the National Electric Company, Milwaukee, Wis., to the National Brake & Electric Company, a Wisconsin corporation with a paid up capital of \$1,000,000. The new company, as successors to the Christensen Engineering Company and the National Electric Company, will continue to manufacture air brakes and electrical machinery, with extended facilities and abundant working capital. The announcement states further that as the pioneer in the manufacture of motor driven air compressors and in the adaptation of air brakes for electric traction service, it proposes to maintain its position by the development of improved devices to meet the new conditions, due to the more exacting demands of the present day trade. The general sales office has been located at 519 First National Bank Building, Chicago.

The Independent Pneumatic Tool Company, Chicago, owing to the great increase of its business during the past year, has been compelled to secure larger quarters for its Pittsburgh and New York offices. The Pittsburgh office has been moved from the second floor of the Germania Bank Building to the twelfth floor of the Farmers National Bank Building, and the New York office from the thirteenth floor of the Broadway-Maiden Lane Building, 170 Broadway, to the sixteenth floor of the same building. A complete line of pneumatic tools and appliances and extra parts will be carried at these offices.

Work on the Blackwell's Island Bridge, New York, which was interrupted in October, 1905, by the strike of the Housesmiths' Union, was resumed on May 15 with a force of 60 nonunion men. It is expected that 100 men will be at work by the end of the week.

Philadelphia Machinery Market.

PHILADELPHIA, PA., May 15, 1906.

Manufacturers as well as dealers in machine tools in this territory are generally well pleased with the volume of new business being offered. The demand has been fairly distributed among the various lines of tools, the sizes taken, however, being more particularly those of the medium rather than of the heavier types. The bulk of the business transacted has been made up of a large number of sales covering individual tools. Here and there a sale of some three or four tools to one concern has been made, but nothing larger than tool room equipments has developed during the past week or two. The railroads continue to withhold specifications for any quantity of tools. A few small orders, however, have developed from that source, particularly in cases where quick deliveries are desired. In some instances good business from the railroads is looked forward to by the trade, but in most cases the tendency to hold up appropriations for machine tools, as well as other like equipment, predominates.

There has been a right fair run of orders for tools from the Southern territory during the past week, and it is understood that quite a few live inquiries for further equipment are being received from manufacturing plants in that territory. A good volume of business is now anticipated from plants located in the anthracite regions. Some orders which were held up by the strike agitation have already been placed and others are expected to close at an early date.

Inquiries on the whole keep up remarkably well in all branches of the trade. They have a stronger tone, and while confined to small lots, they lead up to business more satisfactory. Manufacturers, as a rule, are taking on about as much business as they can conveniently handle and therefore are unable to catch up on deliveries to any marked extent. Stocks are as low as ever and deliveries off the floor are an exception to the general rule.

Somewhat of an improvement is to be noted in the sales for export. The business, however, has been largely along the line of special tools, there being no change in conditions governing export sales for tools of the standard types. The export business in machinery specialties continues unchanged.

The demand for boilers and engines continues active. Sales of quite a few of those of the medium powers have been made, and there is some further inquiry for those of the larger types for power equipment. Second-hand boilers and engines, as well as second-hand machine tools, have been in good demand and some very satisfactory sales have been reported. There have been no changes in foundry conditions. Iron and steel casting plants continue to have a good tonnage offered and most of the plants find it difficult to supply castings as promptly as desired by the trade.

Samuel Sternberger is having plans prepared for an eight-story factory building to be erected at the southwest corner of Broad and Callowhill streets. The ground plan measures about 100 x 120 feet, and the building will be of reinforced concrete construction. Details are not yet obtainable.

The Victor Talking Machine Company, Camden, N. J., has had estimates made from plans by Ballinger & Perrot for a new building at the corner of Cooper and Front streets, 89 x 100 feet, four stories, with provision for two additional stories to be added in the future. The building is intended for offices and laboratories of the company. It is to be fireproof throughout and to be provided with both freight and passenger elevators. The contract is expected to be let at an early date.

The Philadelphia Rapid Transit Company has posted plans in the offices of Stacy, Reeves & Sons, architects and engineers, for eight passenger stations, to be located along the line of its Market Street Elevated Railroad in this city. All will be of steel frame work and sheathed with copper. Each station includes two buildings of the same size on either side of the tracks, the approaches being wide iron stairways.

The Eynon-Evans Mfg. Company is busy in all departments. The pattern shop was never before as busy at this time, a large amount of machinery and special pattern work being on the books. The demand for this company's new blow off valve has been very large, and shipments have been made all over the country. Steam jet blowers have also been in good demand, and shipments to many of the large steel mills have recently been made. Orders for acid resisting bronze castings for colliery uses have been numerous, and the foundry is busy on this as well as on a general line of brass and bronze castings. Purchases of the complete equipment of its toolroom, mention of which was made in these columns several weeks ago, have, it now informs us, been completed.

I. H. Johnson, Jr., & Co., Incorporated, note a good demand for lathes, inquiries being received from many of the manufacturing districts in the Eastern and Middle Western sections of the country. A number of very satisfactory orders have been taken and all departments of the plant are busy. During the past month the total shipments of lathes were the largest, with one exception, in the history of the

concern, covering deliveries of both large and small lathes to various customers, 36 and 42 inch swing lathes, with long beds, being shipped to parties in the Pittsburgh territory; a heavy 36-inch lathe to New England, and a 54-inch and a number of smaller lathes to local and nearby parties. Several very heavy 38 and 42 inch lathes are nearing completion for some of the large steel works. Orders are sufficient to keep the plant actively engaged for months ahead.

The Link-Belt Engineering Company is busy, particularly so in the estimating department, which is working at its utmost capacity to meet the demands of various prospective customers. The demand for coal handling machinery is particularly good, as is also that for the general line of transmission machinery. Among some of the work now under construction may be mentioned two coal handling machines, 100 tons per hour capacity, for fueling barges at Havana, Cuba; a coal handling plant for the Weidman Silk Dyeing Company, Paterson, N. J.; a coal carrying device for the U. S. Coal & Coke Company, Gary, W. Va.; a coal handling outfit for the Atlantic Crushed Coke Company, Braddenville, Pa., and a car hauling apparatus for the H. C. Frick Coke Company. Phosphate handling machinery is also to be furnished the Phosphate Mining Company and the Pierce Phosphate Company for use at their Lakeland, Fla., plants. A number of sugar cane handling outfits are also to be furnished parties in both Cuba and Porto Rico. The Link-Belt Company, in view of its largely increased business, has extensive additions to its plant in contemplation, details regarding which have not yet been decided upon.

The Energy Elevator Company notes that while local business has during the past month been only fairly active, out of town orders have increased quite largely. The demand covers the full line of electric, power and hand freight elevators and dumb waiters. Orders for a large electric elevator for installation at 922 Cherry street and a heavy hand power freight for parties at Eleventh and Chestnut streets have been received, and a number of others are in course of installation. Shipments of elevators to parties in Harrison, N. J.; Rockford, Ga.; Raleigh, N. C.; Jacksonville, Fla.; Greenville, Tenn., and Gagetown, Mich., have also been made. A special carriage elevator, the third of its kind, has also been furnished a party in Red Bank, N. J.

New England Machinery Market.

WORCESTER, MASS., May 15, 1906.

The manufacturers of lathes, planers, shapers and upright drills, who as members of the National Machine Tool Builders' Association have voted to increase their prices 5 per cent., are putting the new prices into effect as rapidly as they can get out their new lists. In fact, the new prices may now be considered as being operative at this time. The matter of the advance has been somewhat complicated by the terms of the vote of the association at the Atlantic City meeting, the advance being on the resale price and not on the price to the dealers, as has been the rule in the past. Such was the announcement at the close of the meeting. Nevertheless not all of the machine tool men interested take this view of the advance. The resale price came into the question when the association was considering the change in discount to the dealers increasing it from 10 to 12½ per cent. When it was decided to take no action on this change beyond referring it to the several sections of the association for their individual action the matter of resale price became no longer an important element, it is stated. The result is that the various manufacturers have figured their advance of 5 per cent., according to their individual methods of fixing prices, but the result is practically the same in all instances. Where the list price is identical with the resale or customer's price the advance is usually on the list, which is equivalent to advancing on the resale price. That is if the old list price of a tool is \$1000, and the price to the dealer 10 per cent. off, or \$900, the advance is 5 per cent. of \$1000, or \$50, making the total price \$1050, and the discount to the dealer \$105. But in certain instances the list price is greater than the resale or customer's price. For example, if the list price is \$1125, and the dealer gets 20 per cent. off, his price is \$900. The manufacturer protects him to give him a profit of 10 per cent.—that is, the manufacturer will not quote a price less than that which the dealer can make and get his full 10 per cent. on his investment. In such an instance the question comes, What is the resale price? that is the price to the consumer. Consequently the manufacturer advances on his list price, which is not the resale price, and gives the dealer 20 per cent. off on that. There is no difference, when it comes to figuring, between this method and advancing the dealer's price 5 per cent. In some instances the manufacturer takes the short method of maintaining the present list or resale price and reducing the dealer's discount from 10 to 5 per cent. The 5 per cent. thus lost by the dealer he makes up in his own advance to his customer. The manufacturer's price to the customer is the same as the dealer's of course. So when the whole matter is simmered down it will be found that the

advance throughout the trade amounts to the same thing, though at first glance there would seem to be a difference. This apparent discrepancy has led to some discussion, and it has been a complicated argument until straightened out by figures of proof.

The radial drill builders are working toward a readjustment of prices, which will be in the nature of an equalization, to form a basis preliminary to a general advance in prices following the lead of other types of machine tools. Radials have not as yet been affected by the action of the National Machine Tool Builders' Association. Individual manufacturers have made advances, following the market, but there has been no agreement. It is now believed that a general advance by the members of the National Association will be made within a short time. Unless something intervenes in the process of equalization this will surely be a fact.

The L. A. Starrett Company, Athol, Mass., manufacturer of machinists' tools, is to make extensive additions to its plant this season. A new factory building will be 40 x 140 feet and four stories; a building for the hardening department will be 40 x 60 feet and one story, and there will be a new storehouse 60 x 60 feet and two stories. All will be of brick, mill construction.

The Merrimac Iron Foundry, Lawrence, Mass., has let the contract for a new foundry building, 100 x 200 feet and two stories, and an office building, 25 x 80 feet and one story.

The improvements to the plant of the Bigelow Company, New Haven, Conn., boiler manufacturers, will include an addition 50 x 230 feet.

The contract has been let for the new electrical laboratory of the Worcester Polytechnic Institute, Worcester, Mass., which will cost \$125,000. A considerable part of the necessary equipment, mechanical and electrical, is yet to be purchased, including the cranes, with the exception of a 10-ton electric traveling crane, the contract for which has already been placed with Pawling & Harnischfeger, Milwaukee. The general laboratory room will be 55 x 200 feet, with three galleries, affording altogether 19,400 square feet of floor space, which will make it, it is said, the largest laboratory of its kind in the world. The traveling crane will serve the main floor of this room. The galleries will be served by 2-ton trolley hoists. A workshop will require machine tools for repair work and for the construction of such special work for the laboratory as can be accomplished advantageously. The building will be large enough to provide a large amount of space in addition to the general laboratory.

An important electric development of water power is to be made at East Hampton, Conn., by a corporation known as the Salmon River Power Company. A reservoir having a storage capacity of 1,300,000,000 cubic feet of water will be constructed, the water to be used for the development of electric power. The engineers in charge, the Rhode Island Construction Company, Providence, will have additional details to give out as to power to be generated in a few weeks.

At the annual meeting of the Baush Machine Tool Company, Springfield, Mass., held April 23, the following changes in the officers of the company took place: Edward A. Appleton was elected president, to succeed H. R. Dalton, Jr., resigned; G. Frank Adams, vice-president; C. J. Wetsel, treasurer and general manager, and F. E. Bocorselski, superintendent.

The Stanley-G. I. Electric Mfg. Company, Pittsfield, Mass., announces very important enlargements to its works for this season. The main machine shop is 60 x 500 feet, and the addition will be of the same size, parallel to and connected with it. The buildings lie on the north side of the Boston & Albany Railroad. It naturally follows that the company will be a large purchaser of machine tools during the season. In common with the other plants of the General Electric Company the Pittsfield works are generally in the market for more or less machine tools and other equipment, but this season's new buildings will be larger than usual. The Stanley-G. I. Company has recently come to an agreement with the city of Pittsfield as to the discontinuance of a certain street, and in return the company agreed to expend large sums of money in improvements, including, according to the Pittsfield papers, \$250,000 within three years and \$750,000 within five years. In addition certain land for highway improvements will be given to the city.

The large additions to the plant of the American Waltham Watch Company, Waltham, Mass., already noted in this column, will be but the beginning of very large extensions which will double the capacity of the great works, according to the announcement made in connection with a plan to organize a new corporation, to be known as the Waltham Watch Company, which will take over the stock of the American Waltham Watch Company. The new company will have a capital stock of \$12,000,000, of which \$11,000,000 will be given to the present stockholders in proportion to their holdings of the old stock, amounting in all to \$4,000,000, and the receipts of the sale of the remaining \$1,000,000 will be devoted to enlarging the plant. An idea of the enlargement can be had from the fact that the number of employees will

be increased from 3500 to 6000 when the extensions are completed.

The Boston Gear Works, Boston, Mass., has moved its office to 102 High street, where will be kept in stock a full line of regular gears and chains. The factory remains at Norfolk Downs.

Cleveland Machinery Market.

CLEVELAND, OHIO, May 15, 1906.

Machinery dealers say that there has been quite a pronounced improvement in business during the past 30 days. A number of concerns which have been figuring on making increases in equipment for some time have been placing their orders. The railroads, which have been rather quiet for some months, have been turning in orders for new equipment and the automobile makers continue to furnish good business. Dealers say that deliveries are getting worse, and that on many standard lines it is impossible to guarantee better than five or six months' delivery.

The Cleveland Hardware Company is making some important extensions to its plant, and it has recently ordered some Acme forging machines, several Waterbury Farrel presses and some drop hammers.

The National Malleable Castings Company has placed a contract for the erection of a new three-story building, 200 x 200 feet, and it will install additional equipment.

The H. C. Tack Company is preparing to erect a new building adjoining the factory on the Pennsylvania Railroad tracks which was badly damaged by fire a short time ago. Some new equipment will be installed.

The N. Y., P. & O. Dock Company, Cleveland, which is controlled by Pickands, Mather & Co. of this city, has placed a contract with the Brown Hoisting Machinery Company for the new ore handling apparatus recently referred to. There will be four legs of Brown fast plants, similar to those now in use at Ashtabula. Each leg will be equipped with a 5-ton bucket, and there will be about 350 horsepower of motors on each leg. The capacity of the power station will be increased by the installation of two 500-kw. units, which have not yet been contracted for. The new plant is to be ready by the opening of navigation in 1907.

The Cleveland Board of Public Works has placed a contract with the Allis-Chalmers Company for a 500-kw. turbine generating unit for the South Brooklyn lighting station, now owned by the city. The plant is to be moved to a new site, and other machinery will be installed in addition to the turbine mentioned.

H. Whitford Jones, Citizens' Building, electrical engineer, is placing contracts for the equipment of a large power station for the Lincoln Park Amusement Company, which is building a new amusement park in Cleveland.

The Toledo Railways & Light Company, which is preparing to erect a large power station, has placed a contract with the Interstate Engineering Company, Cleveland, for a fuel handling outfit to take coal from the cars and elevate it to overhead bunkers; also to remove ashes from the pits and deposit it in cars. It will have a capacity of 90 tons an hour. The Toledo company has also just placed a contract for two 500-kw. Westinghouse turbines, to be installed for temporary use by June 1.

The American Fork & Hoe Company, Cleveland, has commenced work on a number of improvements to its various plants. The Ashtabula plant is being doubled in capacity, including the erection of a fireproof forge shop, 60 x 120 feet. Considerable new machinery will be installed in this plant. The Brown & Hinman plant, which was recently removed from Columbus to Memphis, Tenn., is being enlarged by the erection of a new building; the Jackson, Mich., plant is being enlarged and the Geneva, Ohio, plant is being improved. J. A. Carter, who was largely instrumental in forming the American Fork & Hoe Company and who has been its sales manager for the past four years, has resigned, to go into other business. He has been succeeded by Cyrus Rymier, who was with the Withington & Cooley plant of the company for a number of years and who has served as Mr. Carter's assistant since last August. Mr. Carter is still largely interested in the company and continues as a director.

The Maumee Valley Automobile Company, Toledo, has been formed, with \$100,000 capital stock, by F. W. Keating, formerly with the Pope Motor Car Company, Toledo, and George M. Verity, Middletown, Ohio. The company has secured a lease on the Kirk automobile plant, which is owned by the Consolidated Mfg. Company of that city, and it will install considerable new machinery.

The plant of the Ashtabula Mfg. Company, Ashtabula, Ohio, was destroyed by fire last week. The company manufactures hardware specialties. The loss to the plant was estimated at \$55,000. Much of the valuable machinery, dies and presses was badly damaged, but it is thought that some of it can be repaired again. The plant will be rebuilt immediately.

The Cleveland Belting & Machinery Company, Cleveland, Ohio, started business in November, 1899, in a room 20 x 40 feet, buying and selling second-hand belting and

repairing for factories. After continuing in this line for two years the company started to handle second-hand machinery. The business has grown rapidly during the past seven years, and on January 1 of the present year a removal was made to 1922 Scranton Road, where the company has greatly improved facilities, comprising a warehouse of three stories in one building containing 24,000 feet of floor space and another building containing 20,000 feet of floor space on its own railroad siding. While it is doing a large business in buying and selling second-hand engines, boilers and wood working machinery, also handling some iron working machinery, the company still continues the sale of strictly first-class second-hand leather belting.

The Bradner Machine & Tool Company, Bradner, Ohio, has been formed with \$12,000 capital stock by W. P. Tyler, George P. Ahn, R. W. Barton, Rathburn Fuller and Birchard A. Hayes. The incorporation is the result of the reorganization of a company of the same name which manufactures machine tools. The facilities of the plant at Bradner are to be improved.

The Enameled Pipe & Engineering Company of Cleveland has been formed with \$50,000 capital stock by R. F. Nailer, D. H. Sell, J. B. Looker, N. O. Mather and Osborne Esgate. The company will manufacture enamel pipe, pumps and fittings, using a special enamel which, it is claimed, will prevent electrolysis, and which is the invention of R. F. Nailer of Akron. The company will also do a general engineering, designing, consulting and constructing business. A factory will be established in Cleveland. Mr. Nailer will be in charge.

The Interstate Engineering Company, Cleveland, has been awarded a contract for the bridge work on the Washington, Baltimore & Annapolis Railroad now under construction between Washington and Baltimore. The work will consist of several bridges and viaducts aggregating about \$200,000. The bridges are to be completed next fall. The Roberts & Abbott Company, Cleveland, engineers for the road, will shortly place contracts for the complete electrical equipment. The single phase system of alternating current, car motors and power house equipment will probably be used.

The Cleveland & Southwestern Traction Company has completed plans and will shortly close contracts for the erection of a large repair shop at Elyria, Ohio, to take care of repairs for the entire line. The building will be equipped with air hoists and a complete machine shop equipment. C. N. Wilcoxon of Cleveland is general manager of the company.

The Cleveland Twist Drill Company, Cleveland, has commenced work on another large addition to its plant on Curtland street and Lake avenue, that city. The building will be 216 feet long and five stories high, and will cost \$62,000. The company has been building a large amount of new machinery for some time back, preparing for this addition, and has recently contracted for considerable other special machinery. This will increase the capacity of the company's output by nearly one-third.

The Cleveland Pneumatic Tool Company, Cleveland, reports that its business for April was the heaviest on record. It is developing quite a large business abroad, as pneumatic tools are becoming very popular in Continental countries. Herbert S. Covey, formerly manager of the Western department of the company, with headquarters at Chicago, has become general sales manager of the company.

The National Metallic Packing Company, Oberlin, Ohio, is considering a proposition from the Board of Commerce of Mansfield, Ohio, for the removal of its factory to that city, but, contrary to newspaper reports, the matter has not yet been decided upon. The company manufactures metallic packing for locomotives, marine and stationary engines, and it has outgrown its present quarters at Oberlin.

W. B. Shiller, president of the National Tube Company, has announced that the company will spend \$500,000 in improving its dock facilities at Lorain. The capacity of the ore handling equipment is to be doubled. The Lorain plant is now producing about 1000 tons of tubing per day.

The Republic Stamping & Enameling Company has been formed at Canton, Ohio, with \$400,000 capital stock. The incorporators are Charles H. Knight, Edward K. Sober, Louis A. Lochoit, W. G. Saxton and Jacob B. Snyder. A 10-acre factory site has been donated through the Canton Board of Trade, and a large plant will be erected for the manufacture of stampings and enamel ware. Plans for the plant have been completed and work is to start in the very near future.

Cincinnati Machinery Market.

CINCINNATI, OHIO, May 15, 1906.

Trade throughout the week in machine tools has held up to normal proportions and there has been no indication of any decrease in new work received. From all along the line comes the report of added contracts, which for the most part means deliveries from two to four months hence. Reports received from the machine tool builders who attended the National Association at Atlantic City indicate that

the meeting was a very enthusiastic as well as a very satisfactory one to all interested, and that the association is much stronger, both numerically and financially, than ever before. Secretary Finch of the Industrial Bureau advises that the bureau is meditating another excursion to the industries that have been induced to locate in this vicinity through the agency of the bureau. The date, however, has not as yet been fully decided upon, but will be fixed at their next meeting. Several of the railroads have extended invitations to the bureau, offering the members the courtesy of the line and agreeing to furnish special transportation facilities.

The American Tool Works Company says that it is crowded with work and that it is using every foot of available space in its plant where a machine can be located that will in any manner tend toward increasing the output. As matters now stand deliveries are considerably delayed, and the new work coming forward in such a rapid manner does not give any particular promise for the better.

The Pothoff & Frey Iron Company, which has for some months past had in contemplation a change in location, has secured a desirable tract of ground on the south side of Front street, near Harriet, where the erection of a two-story factory and office building will at once be commenced. This structure, it is said, will cost approximately \$12,000 and be equipped with up to date machinery.

The Cincinnati Machine Tool Company says that the past week has been an excellent one, so far as new orders are concerned. Deliveries are running some weeks behind, and from present indications there is little prospect of reducing this time. Several new tools have been installed within the past month or two, and the result has been considerably increased output.

Government Purchases.

WASHINGTON, D. C., May 15, 1906.

The Isthmian Canal Commission will receive bids until May 28, under circular No. 309, for pillar shaper and other supplies.

The Bureau of Yards and Docks, Navy Department, Washington, will receive bids until June 2 for two motor generator sets for the New York Navy Yard.

The following bids were opened April 28 for an engine lathe, circular No. 305-C for the Isthmian Canal Commission:

Champion Tool Works, Cincinnati, Ohio, own make, \$305.

R. K. Le Blond Machine Tool Company, Cincinnati, Ohio, own make, \$375.

Manning, Maxwell & Moore, New York, Hendy machine, \$424.

Motley Green & Co., New York, Fairbanks machine, \$325.

Niles-Bement-Pond Company, New York, Le Blond machine, \$345.

Woodward, Wight & Co., New Orleans, La., Springfield Machine Tool Company's make, \$469.

Under bids opened March 19, circular No. 301, for supplies for the Isthmian Canal Commission, class 8, two box bed heading, upsetting and forging machines, was awarded to Manning, Maxwell & Moore, New York, at \$4258.50.

Under bids opened April 3 for supplies for the navy yards the following awards have been made:

Manning, Maxwell & Moore, New York, class 12, one concrete mixer, \$875.

Henshaw, Bulkley & Co., San Francisco, Cal., class 61, one universal tool and cutter grinder, \$526.

The Heine Safety Boiler Company, St. Louis, Mo., has been awarded, class 11, four horizontal water tube boilers, \$9000, under opening of April 17 for supplies for the navy yards.

The following bids were opened May 8 for supplies for the navy yards:

Bidder 20, Bridgeport Safety Emery Wheel Company, Bridgeport, Conn.; 66, James Clendenin, Baltimore, Md.; 87, Chicago Pneumatic Tool Company, New York; 88, Cleveland Pneumatic Company, Cleveland, Ohio; 113, Electric Launch Company, Bayonne, N. J.; 158, Handlan-Buck Mfg. Company, St. Louis, Mo.; 167, Ingersoll-Rand Company, New York; 215, Manhattan Supply Company, New York; 222, Montgomery & Co., New York; 333, Wm. Sellers & Co., Incorporated, Philadelphia, Pa.

Schedule No. 417.

Class 563. One motor driven water tool grinder—Bidder 20, \$394.66; 158, \$355; 215, \$384; 333, \$1320 and \$765.

Schedule No. 519.

Class 610. Two electric motors, two batteries, two charging rheostats, four plugs and receptacles, two chime whistles and spare parts—Bidder 87, \$6900.20; 113, \$7976.40.

Class 618. Pneumatic hammers, rivets and drills—Bidder 87, \$1335; 88, \$816; 167, \$1324.25 and \$1292.25; 222, \$1535.

Under opening of April 12 for steam shovels for the Isthmian Canal Commission the Bucyrus Steam Shovel

Company, Milwaukee, Wis., has been awarded contract for two 45-ton steam shovels at \$7450 each.

The following awards have been made for supplies for the Isthmian Canal Commission, bids for which were opened March 3:

Pratt & Whitney Company, Hartford, Conn., class 83, one toolroom engine lathe, \$780.

Handlan-Buck Mfg. Company, St. Louis, Mo., class 85, one hand bending rolls, \$470.

The following awards have been made for supplies for the navy yards, bids for which were opened April 17:

Fairbanks Company, New York, class 13, one planer, \$1157.75.

Fox Machine Company, Grand Rapids, Mich., class 14, one planer and jointer, \$410; class 22, one universal wood trimmer, \$163.45.

Baird Machinery Company, Pittsburgh, Pa., class 15, one shaper, \$690; class 24, one wet tool grinder, \$87.

Vandyck-Churchill Company, New York, class 17, one 18-inch lathe, \$875.

Oliver Machinery Company, Grand Rapids, Mich., class 20, one swing cutting off saw, \$445.

American Wood Working Machinery Company, New York, class 21, one universal double arbor saw bench, \$590.

Niles-Bement-Pond Company, New York, class 25, one back geared universal milling machine, \$110; class 43, one 20-inch Eberhardt high duty shaper, with direct connected motor, \$910; class 135, one 14-inch back geared screw cutting engine lathe, \$448.

Classes 16, one speed lathe; 19, one single surfer, and 23, one twist drill grinder, will be purchased in open market.

Under bids opened April 20, circular No. 304, for supplies for the Isthmian Canal Commission, the following awards have been made:

Browning Engineering Company, Cleveland, Ohio, class 1, four locomotive cranes, \$25,200; class 2, four locomotive cranes, \$33,300.

H. A. Rogers Company, New York, class 3, four hydraulic jacks, \$1455.

Deane Steam Pump Company, New York, class 6, three feed pumps, \$717.33.

Germany to Investigate Trade Pools.—A memorial on the growth and trade effects of cartels has been presented to the German Reichstag with a view to a legislative investigation of the subject. The essential feature of the German cartel to which attention is called is that in the association of kindred firms for the purpose of attaining prices and regulating production the individual firm does not lose its identity, but is controlled as to output and selling price by a Central Committee. The memorial to the Reichstag classifies and separately indicates the various associations. These now number 385 distinct cartels embraced in 16 categories. In the coal industry 17 cartels are named, including six associations of buyers. The iron industry has 62, and the metal industries other than iron 11. Statistics will be gathered of prices of commodities before and during the operation of the cartels. A study will be made of foreign as well as German combinations, and decisions of courts in cases relating to cartels will be studied with a view to determining what legislative action, if any, should be taken for the regulation and control of these combinations.

The American Foundrymen's Convention at Cleveland.—The secretary, Richard Moldenke, has issued a circular announcing the Hollenden Hotel as the headquarters for the convention of the American Foundrymen's Association at Cleveland June 5-8. Reduced rates have been granted by the railroads, except for Ohio, on the certificate plan, and those who expect to attend the convention are urged to secure certificates on purchasing their tickets.

Manufacturers of special steels in England and the United States have been giving attention of late to the manufacture of steels adapted to the different stresses and shocks to which the various parts of motor car machinery are subjected. One firm has produced a nickel-steel in which an admixture of 3 to 5 per cent. of pure nickel is used for axles, cranks, pistons, connecting rods and engine parts generally. For gears a special case hardened mild steel is provided. A sample of 2½ per cent. nickel-steel has given, on being tested, 32 tons per square inch in elastic limit, 47.2 tons per square inch ultimate breaking strain, 25 per cent. elongation and 37.8 per cent. reduction of area.

Ontario Laws and Enterprise.

TORONTO, May 12, 1906.—After an unusually long and busy session the Ontario Legislature has just concluded its labors for the present year. Measures vitally affecting every department of the Government were placed on the statute book. These enactments have all a marked leaning to the side of the public. So marked, indeed, that certain of them are popularly denominated anticorporation measures, while by the interests unfavorably touched by them they are described as socialistic. Neither designation is quite just.

The Power Act.

Take the case of the Power act. This is the legislative outcome of the report presented by the Hydro-Electric Power Commissioners, appointed by the Government last July. The act constitutes a permanent Hydro-Electric Power Commission. This commission is to be the regulator of the business of electric power supply. As a check upon any tendency toward extreme or ill advised action, the commission's acts and orders are subject to approval by the Lieutenant-Governor in council. By this reserving of the Government's right of final action the act is saved from being socialistic.

On their face the provisions made to insure the supply of cheap power do seem unduly collectivist. The commission is authorized to make the price for power. If a municipality wants a supply of electrical power delivered to it it can have recourse to the commission, asking the latter to quote the price at which the given quantity of electricity could be supplied. The commission engineers would have the matter referred to them, and a calculation of the cost would be prepared and submitted to the municipality. In addition to that set of estimates, the commission would on request furnish plans and specifications for substation and distributing plant. Should the figures and other information thus provided by the commission be satisfactory, the municipality could propose to enter into a contract to take the required quantity of electricity from the commission. It is necessary, however, for the municipal corporation to submit a by-law to the rate payers enabling it to join in such a contract.

When agreements are entered into the commission must, of course, carry them out. But for the performance of them a power generating plant and transmission lines are required. The act contemplates the use of existing works. In fact, it leaves ample opportunity for private enterprise to retain the power business. In other words, there is no rash plunge into public ownership. The contracts made by the commission must be on a basis that affords a reasonable profit on the cost of supplying the power. Hence, when the commission has quoted its price for a given town the power companies have the option of themselves directly taking the town's order at that price, or of letting the commission take it. If the latter, there still remains the chance of the company supplying the power to the commission for delivery to the town. Should the company elect to do neither of these things the commission may proceed to acquire the means of supplying the electricity.

If it is a transmission company that declines to be a party to the contract on the terms proposed by the commission the commission is authorized to acquire a transmission plant. It may take over the company's line by lease, purchase or expropriation. If the commission wants the line nothing can prevent the commission taking it. And if the contumacious party is the generating company, its plant can also be acquired. Whatever expenditure has to be made for the purpose of getting possession of a plant is to be paid by the Province, and the total cost is to be divided equitably among the municipalities supplied by the commission. In form the Provincial outlay is a loan to the municipalities for 30 years at 4 per cent.

Niagara power interests have condemned the legislation as an attack on capital. The disposition of the Government, however, is plainly not antagonistic to capital. It was because rates involving excessive profits had been quoted to power users that the Legislature was appealed to. Since the act was passed the Electrical Development Company of Ontario has stated through one of its officers

its intention to supply water at the lowest price possible. This doubtless is what will happen. If the companies are careful the commission will remain purely an influence and will never become an operating or plant owning concern.

One effect of the commission's creation will be an enlarged demand for power. Industrial expansion is the order of the day. It seems to be peculiarly of the time-spirit that is working in the towns and cities of Ontario. It is a very modest spot that is not now visited by dreams of industrial greatness. Now that it is known that electrical power can be distributed over a large part of the Province at prices considerably less than half those at which coal power can be produced, interest in the public water powers has livened up. Moreover, the assurance that electrical power is obtainable at low prices will remove much of the hesitation to change from steam plants. It is extremely likely that the new Power act will cause an increase in the demand which would not have been experienced had a free hand been left to the companies. In the end, therefore, the companies may gain more than they lose as a result of this legislation.

The Government's Cobalt Policy.

The course decided on by the Ontario Government in respect to mineral deposits in its possession in the Cobalt mining area also took capitalists by surprise. A portion of that area known to be very rich is the Gillies limit. Upon that stretch of the Crown lands prospectors had begun to swarm shortly after the boom, of which the town of Cobalt is now the center, had started. Though the property in question is within the public domain, it is under license to parties who acquired the timber on it. These parties took measures to exclude prospectors as trespassers, and finally the Government closed the dispute between the persons whom it had licensed to explore for minerals and the persons whom it had licensed to cut timber. It withdrew the land from the area open to mining enterprise. Since that time prospecting went on in a clandestine manner, and it was believed that the moment the Gillies limit was thrown open again, as it was expected to be this spring, there would be a rush and possibly bloodshed on the part of contending claimants. All this has been avoided by the decision of the Government not to throw the land open, but to hold it and develop its mineral resources for the people. It is expected that the working of the property will bring probably \$2,000,000 a year into the Provincial treasury.

Another step having less the appearance of socialism, but not more partial to the interests that usually get control of mining lands, is that relating to the mineral veins in a three-mile section of the Temiskaming & Northern Ontario Railway's right of way. As this railroad belongs to the Government, its right of way is part of the Crown estate, and minerals thereon are at the disposal of the Government. The rights in question have been offered by tender, the 10th inst. being the last day for receiving such offers, which are to be opened on the 15th inst. At least \$50,000 must be bid. The purchaser must divide the proceeds of his mining operations with the Government as follows: He must pay 10 per cent. of the value of all ores yielding \$400 a ton; 25 per cent. of the value of ores yielding from \$400 to \$1000 a ton; 50 per cent. of the value of ores yielding more than \$1000 a ton.

The Mining Act.

Another important issue of the session is the new Mining act. As the law stood before, it was possible to keep mining lands tied up without benefit to the Province. A speculator who had possession of a promising iron property could hold it as long as he pleased after the patent was issued. A practice very detrimental to the mining interests was that of "blanketing" large areas. A prospector would be restrained from venturing out into the wilderness by the chance that when he should discover a location he might find it within the scope of some blanket claim. This cannot happen under the new law. That being so, there is reason to believe that the quest for mineral deposits will be much shortened and that discoveries of importance will be made in the near future. Exploration of the tracts which the geologists have marked as iron fields is certain to be more or less stimulated by the new act.

C. A. C. J.

Labor Notes.

The strike of structural iron workers at Chicago was settled Thursday afternoon, May 10, and the strikers returned to work forthwith. An agreement was reached in a conference between representatives of the Iron League and the National Erectors' Association of the Bridge and Structural Iron Workers' Union whereby the men will be paid 60 cents an hour. The old scale was 56¼ cents an hour and the men had demanded 62½ cents. Other phases of the peace pact are embodied in the old agreement of the union and employers, including the eight hour day and overtime pay. Building is now again in full swing, the men reporting for work with alacrity, and the threatened tie up of construction, involving all building crafts, is at an end. On the South Side Elevated extension alone is work at a standstill, owing to a special strike in that case.

The bituminous coal operators of Illinois, Indiana and Ohio showed no signs of weakening from their position at the meeting held at the Auditorium Hotel, Chicago, last week, but declared that they wanted to do more than "stand pat." The Ohio operators took the initial step and on returning home posted notices giving the United Mine Workers until May 21 to return to work at the present scale or find their places filled by nonunion workmen. Many of the Illinois and Indiana operators were anxious to follow the lead of the Ohio operators, but action has been postponed by the request of President Perry of the Illinois Mine Workers for a joint conference between the Illinois miners and operators. The Illinois operators have wanted such a meeting since the strike began but have not been able to secure it and the proposition of President Perry was immediately accepted. The conference will be held Thursday of this week, at Springfield.

A Southern branch of the National Metal Trades' Association was organized recently, with headquarters at Atlanta, Ga. Other new branches reported are those at Indianapolis, Ind., and Springfield, Mass.

The regular bimonthly settlement of the Amalgamated wage scale governing puddlers and finishers was made in Pittsburgh last week. The average price of shipments of iron bars made by the Republic Iron & Steel Company in March and April was shown to be 1.60 cents, which means that no change in wages of puddlers and finishers will be made during May and June. Puddlers are now receiving \$6 a ton, the highest wage paid for puddling for several years.

The purchase of 20,000 additional steel cars by the Pennsylvania Railroad Company which has been currently reported proves to be without foundation in fact, as no such order has been placed or does such a purchase appear likely in the near future. It is possible that the rumor grew out of the recent purchase by the Pennsylvania Railroad Company of the material for the construction of 1000 new refrigerator cars which, as it was announced in these columns, were to be built at the Altoona car shops, and this purchase, together with belated notices of the last orders of the 39,000 steel cars which were purchased last fall, is doubtless responsible for the present erroneous statement.

Nineteen prosecutions under the anti-smoke ordinance are pending in New York City as the result of Health Commissioner Darlington's recent crusade. The chief engineer of the New York Edison Company was found guilty last week of violation of the ordinance. Sentence was deferred until May 21. The maximum penalty is \$500 fine or one year in prison. In the trial of this case several hundred photographs were introduced, these being taken between March 21 and 30, 1906, between 1.30 and 5.30 p.m., and all show no smoke issuing from the power house stack. On behalf of the prosecution it was shown that the heavy load came after 5 o'clock and that from that time on dense smoke issued from the stacks.

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HARDWARE

IN developing a system of factory costs and accounting so that it shall meet the requirements of an individual manufacturing establishment it is imperative, after a general plan of the system has been determined upon, that it be taken up piecemeal and scrutinized in its various parts. This is a necessary precaution, that defects and weaknesses may not creep in and vitiate any of the great good which a carefully devised method will accomplish. Each part of the system should therefore from time to time be carefully examined, in order that it may be ascertained how nearly it accomplishes its purpose.

It is generally conceded that many systems are weak in the method employed of apportioning the very important item of general expense, known variously as burden, indirect expense, overhead expense, &c. Much difference of opinion exists concerning the best basis upon which to figure the percentage representing this item. Commonly the total of productive labor in dollars and cents is used. Occasionally the total number of hours of productive labor is reckoned and the general expense apportioned by productive hour. Either system comes close to exact results, provided the method of apportioning the great item is otherwise correct.

An important and common fault is that general expense is apportioned equally among all products, regardless of the fact that all lines of manufacture do not pass through all departments of the works; that some departments are more expensive to maintain, outside of productive labor, than others; that the percentage of general expense to productive labor is greater in one department than in another, and that consequently one article of product may be made to bear too great a share of the general expense, while another article may bear too small a share. The division of the item into several factors is becoming a more general practice. The departmental general expense is separated from the general expense which applies to the works as a whole—that is, which every article of product must share, regardless of how great or how small a share it should bear of the costs of the departments.

The problem is not a simple one, but it is far more important than is generally realized. There are instances where every item of cost, with the exception of general expense, is reckoned with exceeding care, and then an arbitrary percentage added for general expense, this percentage being always the same, good times as well as bad, and never accurate. These are extreme cases. The manufacturer who solves the problem will be well repaid for the thought and expense which it may entail, for with the rest of his system accurate, as it very well may be, he will have costs as exact as are necessary in any business, and the more exact the known cost the closer and more intelligently he will be able to figure in the market, an important consideration in times of slack business, if not to-day.

Condition of Trade.

Neither in the volume of business nor in the matter of prices is there important change to be noted in the Hardware market. All classes in the trade are fully occupied with current business and there is little to disturb the regular course of things, except that perhaps in an increasing number of lines there is difficulty in getting goods as promptly as is desirable. Manufacturers generally are pushing their factories to their fullest capacity, but their output would in many cases be greater were it not for difficulty in getting raw material and in securing sufficient and competent help. Skilled labor is, in many parts of the country, scarce, and the tendency, with comparatively few open advances, is little by little in the direction of higher wages. This, with the natural growth of expense, tends to increase constantly the cost of making goods. One prominent manufacturer, indeed, refers to the fact that in spite of the constant improvement of his plant, the keeping of machinery thoroughly up to date, and the adoption of many labor saving methods and devices, the general cost of his goods, especially as regards labor, was never so high as at the present time. This experience is probably more or less frequently reflected in many factories, although there is no doubt that in some directions, and not a few lines of goods, the cost of manufacture is, all things considered, being reduced. The persistency, however, with which the expense of carrying on business, in both the producing and distributing departments, tends to grow, is an important fact which must be reckoned with. Merchants also, both wholesale and retail, have a somewhat similar experience as the cost of doing business constantly increases. This, with the tendency toward narrower margins of profit, requires the best management and most vigorous prosecution of business in order to secure satisfactory results. Fortunately at the present time the existing prosperity gives encouragement to enterprise and energy and should reward merchants and manufacturers with a substantial measure of success.

Chicago.

Local jobbers report a heavy demand for all kinds of Builders' Tools from San Francisco, and large shipments have already gone forward. These purchases are being given precedence over all orders, and no efforts are being spared to make immediate shipments. As the manufacturers of these goods have been unable to cope with the current demand for several months shipments will be still further deferred until the first rush of orders from the stricken city are filled. This market is practically barren of Corrugated Galvanized Sheets 26 and 27 gauge, owing to the heavy San Francisco demand, and they cannot be secured from the mills in less than two months. The same condition prevails on Black Sheets, and all concessions have been withdrawn by the independent manufacturers, who are compelled to pay higher prices for their raw material than at any time in the past two years. An advance on Tin Plate is threatened, owing to the sensational advance in Pig Tin, although most of the large buyers covered their last half requirements before the recent advance went into effect. Otherwise prices are without change and no advances are anticipated at this season. The month's business thus far shows a comfortable increase over the same period last year, although the volume of trade is smaller than during April. Permits for new buildings during April aggregated over \$12,000,000 and surpassed all like periods in the history of the city. The consumption of Builders' Hardware promises to exceed that of 1905, and as manufacturers are already be-

hind on deliveries there is no hope of securing early shipments during the remainder of the year. The crop outlook is exceedingly propitious, and the corn acreage according to reports will be the largest in the country's history.

St. Louis.

NORVELL-SHAPLEIGH HARDWARE COMPANY.—Weather cool and clear. Roads good. Spring plowing three weeks late. Winter wheat ideal. Numbers of orders from salesmen and by mail and total volume of business show very satisfactory increase over last year. A few manufacturers not filling orders promptly.

We now approach the season of Saturday half holidays and vacations. Experience would lead to the recommendation that if an employee desires 14 days' vacation he take only 11 days, reserving the other three days in which to recuperate from the usual sickness following a vacation.

The writer has just returned from San Francisco. Conditions in that unfortunate city have not been exaggerated in the press. While the property loss has been enormous, estimated at \$300,000,000, there has been comparatively little actual suffering. Walking over the city six days after the earthquake and while the ruins were still smoking, no one had any difficulty in obtaining a sufficient quantity of plain food or of finding shelter of some kind from the elements.

The general appearance of courage and cheerfulness prevailing was surprising. In Union Square, opposite St. Francis Hotel, I heard a man playing on a piano the well-known air, "There'll Be a Hot Time in the Old Town To-night," while the refugees camped in the park stood around and vociferously applauded the sentiment. No doubt, however, the outward air of merriment covered many an aching heart.

Hardware stores in neighboring towns were doing a booming business. As practically every house within a radius of 150 miles lost its chimneys, Brick Trowels are now in great demand on the coast. Other items in the Hardware line that will be needed immediately in large quantities are Shovels and Picks, Shovel and Pick Handles, Butts and Hinges, cheap Rim Locks, Dinner Buckets, corrugated iron, Trowels and Stonemasons' Tools, not to mention the enormous quantity of steel that will be used for new buildings.

Returning, the writer stopped in Los Angeles. It is a wonderfully active and progressive city. The Hardware stores visited all seemed to be doing a good business. There are about 40 retail Hardware stores in Los Angeles. In these stores Builders' Hardware and Tools were prominent. Los Angeles is a great market for Gas and Oil Stoves, for both cooking and heating. The Jonathan Club of Los Angeles, with its magnificent equipment, central court and roof garden, is one of the most hospitable clubs in the country. The Santa Fé Railroad is to be complimented on the most excellent service of the "Limited" from Los Angeles to the East. The dining cars were especially appreciated after the naturally limited fare in the vicinity of San Francisco.

Louisville.

BELKNAP HARDWARE & MFG. COMPANY.—The iron and steel markets still continue steady. Contracts for the year's products seem to have been made, which will afford the mills employment until late in the fall. The settlement of the dock handlers' strike on the lakes and also that of the anthracite coal miners gives promise of peaceful busy times.

The use of everything in the way of constructive material still progresses, even in concrete work, where the reinforcing steel bars are no inconsiderable item. All the railroads are liberal in their requirements, not only in adding to their equipment of motive power and cars, but in maintenance of way. Judging from the Tools called for the announced double tracking, extension of sidings, rebuilding of trestles and bridges, there will be plenty to do for some time to come.

The absorption into the ranks of labor of the thousands of immigrants is a never ceasing source of wonder, but there never was a time when the services of

willing workmen were more in demand or better paid for than just now. The fact is that the earnings are so much better than men have been accustomed to that they frequently from choice will remain idle several days in the week to live out the margin accumulated on the remainder.

In the meanwhile comes the cry for more pensions from every quarter. The record of Congress in passing private pension bills is something to make us think. Thousands in the civil service of the Government are now calling for pensions from every side, claiming that if the victories of peace are no less renowned than those of war that the pension of the civil service should be no less secure. They all proceed on the supposition that this is a surpassingly rich nation. The word "surpassing" seems to be a favorite one to conjure with. Of course the country can afford it; therefore there should be what practically amounts to an old age pension for everybody. This means discouragement of thrift and forethought on the part of those who are filling these positions to-day, and the release from all filial obligations of relatives to support the aged. It is a very easy way to get rid of the responsibility, to be sure, but it is to be hoped that it will some day reach its limit. Positions under the Government are much sought after on account of good pay and comparatively lighter work, the hours are not so exacting as in commercial life, so it is only reasonable to ask that those who occupy them be content with their wages as long as their service is given. The very fact that so many of them live to an old age shows that the life is not over strenuous.

Cleveland.

THE W. BINGHAM COMPANY.—Activity in all lines of Hardware, Mining, Milling and Manufacturers' Supplies is quite prevalent at the present time, and especially so in House Trimmings. Despite the advance in lumber, brick and other material, also labor, reports from all over the country indicate that a great amount of building is going on, and especially is this true in the Great Middle West. There seems to be plenty of money to exploit new undertakings, and those who are about to build new homes inquire for and seem to want material and House Trimmings of the best quality.

The advance in Staple and General Hardware is not so strongly in evidence as yet as on other materials that enter into buildings. For example, the price of Nails, Hinges and Butts is just about the same as it has been for the last year or 18 months, and every one knows that the price of House Trimmings is still very low, for the reason perhaps that the large jobbers throughout the country, especially in this section, entered large orders at the factories six months or a year ago, and still have on hand a large variety of these goods that they are offering at prices that are lower than warranted by the present prices demanded by manufacturers.

When you take into consideration the great advance in prices of metals which enter so largely into House Trimmings one can readily see that there must be an advance in the price of these goods very soon by the jobbers, for when they clean up their present stocks they will have to pay more money for the same goods. Take, for example, the difference in price of metals as follows:

	April 24, 1905. Cents.	April 24, 1906. Cents.	
Tin	30½	39½	About 30 % advance.
Antimony	9	22	About 144 % advance.
Pig Lead.....	4½	5½	About 20 % advance.
Copper	15½	18½	About 23 % advance.

The prices for April, 1906, do not represent the market on these metals at the present time. They are now very much higher, and the demand for all these metals which enter so largely into manufactured Hardware is steadily increasing, not only in this, but foreign countries. So much of these metals, tin, antimony, pig lead and copper, are being used in electrical work, which is a business that is developing into unknown limits, that it would seem as time goes by that the demand will more than equal the supply.

We simply mention these facts to emphasize what we have formerly said that we believe it is really to the in-

terest of all retail dealers to place their orders for General Hardware and House Trimmings in liberal quantities at prices jobbers are now offering on these goods, for the retailer might just as well take advantage of the low prices that are being offered as to let the jobbers make it all. We are firm believers in reciprocity, and we put it to the trade in this way: If you will place your orders for these goods now, they will be supplied at prices that will be not only to your advantage to put them on your shelves at the present time, but every day that you own the goods they will increase in value. We advise you to get out and "shake the bushes" in your district—that is, find out who is going to build a house, block or barn—and show the builders what goods you have on hand and the prices at which you will supply them. Get your contracts in early, and you will thank us for this advice and your customers will surely thank you for your efforts in their behalf. Keep busy; keep digging out new trade; don't let your trade go away from home.

Nashville.

GRAY & DUDLEY HARDWARE COMPANY.—Business continues to be very satisfactory in this section. While May is rather a dull month with the Southern jobbers, and most of them are now in the midst of stock taking, at the same time orders are keeping up unusually well and are rather large and contain a better class of goods than is generally called for at this season of the year. May will doubtless show a considerable increase over the same month of last year.

Crop prospects are excellent, and while the weather has been quite cold for the season, it has not done any damage so far as we can learn. Collections are good.

Baltimore.

CARLIN & FULTON.—Business at the present time compares very favorably with last year, but we are rapidly approaching the duller season of the year—the months of June and July.

The demand for goods has been excellent during the entire year, the weather conditions having been such that no interruption to outdoor work has occurred, and in many lines the factories have been unable to fill orders with the promptness the trade would like, this being particularly the case with Building Hardware.

The basic conditions for future business are, as well as we can judge, most excellent. Labor is well employed; in fact, in many sections there is a great scarcity. In our own State we hardly know what the agricultural sections will do for hands, inasmuch as our municipal improvements, involving a sewerage system for the entire city, the rebuilding of the docks on our entire water front and the repaving of the city, will give steady work for several years to all unskilled labor obtainable.

The threatened coal strike has fortunately been averted. The growing crops are looking fine. The cold weather of last week, though injurious to some of the small fruits and vegetables, has done very little serious damage. Railroad earnings indicate an immense movement of merchandise in all directions, while the orders placed by the railroads for betterments mean an immense business in certain lines of manufacture.

The misfortunes of San Francisco will result necessarily in an immense demand for Hardware to rebuild the city, and the manufacturers will be simply overwhelmed with orders, making deliveries more difficult than even at the present time. It is to be hoped that the capital pouring into San Francisco in the payment of insurance losses will return to the general channels of trade, especially in time to move the next season's crops, otherwise there will probably be a stringent money market, which will not be beneficial to trade. Fortunately a large portion of the loss was sustained by foreign companies which will result in many millions of foreign capital being paid into this country, most of which will return to the East sooner or later.

Philadelphia.

SUPPLEE HARDWARE COMPANY.—This is the time of year when, according to the almanac, Hardware business in this section should begin to shade off a little and the

spring rush be traveling at a more leisurely gait. This year, however, the contrary is the case, and, notwithstanding the cold snap of last week and the six weeks' inactivity at the coal mines, trade is surprisingly active and of large volume, and great difficulty is being experienced by all those who handle Builders' Hardware to get prompt deliveries. Notwithstanding the constantly increasing cost of both Hardware and materials that enter into a building, as well as labor, there seems to be no diminution in the building boom from one end of the land to the other.

The enormous demand that California will make on Eastern factories in the next two or three years will serve as a bull argument, if any is needed, to maintain prices. Indeed, the signs of the times are encouraging to manufacturers in all iron products. The eagerness with which the railroads placed orders for Steel Rails for 1907 delivery as soon as the schedule was announced on May 1 shows that these large buyers do not anticipate lower prices. With the settlement of the coal strike and the generally favorable crop reports we cannot help but feel that 1906 is going to be another record breaker.

Portland, Oregon.

FAILING, HAINES & McCALMAN.—All jobbers in this territory are very busy, owing to the demand from San Francisco. Some dealers in other lines have sent travelers into that territory, but the Hardware houses are not as yet taking advantage of San Francisco's misfortunes. Stocks in all lines are getting low, but California's demand will probably slacken soon, as all the jobbers have opened offices and have stocks on the road.

General business conditions here are good and everything points to a prosperous summer. Collections are good and there seems to be plenty of money in the country. As evidence of the prosperous condition here the San Francisco relief fund from Portland alone now amounts to \$250,000, with more coming.

NOTES ON PRICES.

Wire Nails.—New business, except from San Francisco, is comparatively light, but the mills are making shipments on contract orders in good volume. Quotations are as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in ten days:

Carloads to jobbers.....	\$1.85
Carload lots to retail merchants.....	1.90

New York.—For small lots from store demand is fair, showing some improvement on previous weeks. Reports are to the effect that jobbers' prices are being well maintained. Small lots from store are quoted on the basis of \$2.15 per keg.

Chicago.—Considering the season the demand for Wire products holds up unusually well and jobbers generally report the receipt of large orders from the retail trade. Heavy shipments continue to be made from Eastern mills to San Francisco, where the consumption of Nails promises to be tremendous, owing to the large number of temporary structures that will be erected there. While the early crop reports are very favorable nothing definite can be ascertained as to their extent until later in the season, but as the acreage on the whole has greatly increased, as compared with that of last year, record crops are looked for. Quotations are firmly maintained as follows: \$2 in car lots to jobbers and \$2.05 in car lots to retailers, with an advance of 5 cents for less than car lots from mills.

Pittsburgh.—Only a small amount of new business is being placed, but shipments from the mills on contracts are quite heavy. Prices continue firm, except to certain points of delivery in the South, to which some of the Ohio River mills have low rates of freight. Heavy shipments of Wire Nails to San Francisco are being made and will continue for some time. Prices are firm, as follows: Wire Nails, \$1.85 in carloads to the large jobbing trade and \$1.90 in carloads to retail merchants, f.o.b. Pittsburgh, plus actual freight to point of delivery, terms 60 days, less 2 per cent. off for cash in ten days.

Cut Nails.—Condition remains much the same as noted last week, new demand being steady, but somewhat light in volume. Shipments on contract orders are fairly large. Owing to competition the market continues to show some irregularity, a concession of 5 cents per keg being made in some instances, on carload orders. Quotations are as follows: \$1.75 to \$1.80, base, for carload lots, f.o.b. Pittsburgh; \$1.85 for less than carloads, f.o.b. Pittsburgh; \$1.95 for carload lots, on dock, New York; \$2 for less than carloads, on dock, New York. Iron Cut Nails at points west of Buffalo and Pittsburgh are held at 5 to 10 cents advance on Steel Cut Nails.

New York.—For small lots from store the demand is fairly good. It is reported that there is some irregularity in the local market, but no change has been made in jobbers' quotations, which are on the basis of \$2.05 per keg.

Chicago.—A steady movement of orders is noted toward the mills and continued heavy specifications are being made by the retail trade. Quotations are as follows: Steel Cut Nails in car lots, \$1.95; less than car lots, \$2; Iron Cut Nails, \$2.05 in car lots; less than car lots, \$2.10.

Pittsburgh.—The unevenness in prices of Cut Nails referred to in this report last week still continues, and only a small amount of new business is being placed. Mills are making fairly large shipments on contracts. We quote Cut Nails at \$1.75 to \$1.80, base, f.o.b. Pittsburgh, for carload lots, and \$1.85 in less than carload lots. For Iron Cut Nails an advance of 10 cents per keg is charged.

Barb Wire.—Mills are largely employed filling orders from railway companies, the demand from the Hardware trade not being at all active. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in ten days:

	Painted.	Galv.
Jobbers, carload lots.....	\$2.00	\$2.30
Retailers, carload lots	2.05	2.35
Retailers, less than carload lots.....	2.15	2.45

Chicago.—There is little demand at the present time from agricultural communities, although the railroads are buying heavily and the mills are operating in full on this tonnage. Quotations are firmly maintained, as follows: To jobbers, Chicago, car lots, Painted, \$2.15; Galvanized, \$2.45. To retailers, car lots, Painted, \$2.20; Galvanized, \$2.50. Retailers, less than car lots, Painted, \$2.30; Galvanized, \$2.60. Staples, Bright, in car lots to jobbers, \$2.10; Galvanized, \$2.40; car lots to retailers, 10 cents extra, with an additional 5 cents for less than car lots.

Pittsburgh.—Most of the Barb Wire being shipped out at present is going to the railroads. Demand from the Hardware trade is about over for this season. Prices are firm, as follows: Painted Barb Wire, \$2, and Galvanized, \$2.30, in carload lots to the large jobbing trade, with the usual advance of \$1 a ton to retailers in carload lots, f.o.b. Pittsburgh, 60 days, or 2 per cent. off for cash in ten days.

Smooth Fence Wire.—The mills are employed to some extent on orders for nearby shipment. Contract orders for future delivery are being placed, and their volume indicates that fence manufacturers anticipate a large business. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in ten days:

Jobbers, carloads	\$1.70
Retailers, carloads	1.75

The foregoing prices are for base numbers, 6 to 9. The other numbers of Plain and Galvanized Wire take the usual advances, as follows:

	6 to 9	10	11	12&12½	13	14	15	16
Annealed.....Base	\$0.05	.10	.15	.25	.35	.45	.55	
Galvanized....	\$0.30	.35	.40	.45	.55	.65	1.05	1.15

Chicago.—Large contracts continue to be placed by industrial concerns for their future requirements, and the tonnage requirements are somewhat in excess of those specified in the contracts placed last summer. Fence manufacturers are not specifying very heavily, as their season is about at an end. Quotations are firmly maintained, as follows: To jobbers, \$1.85, f.o.b. Chicago, in car lots, and car lots to retailers, \$1.90.

Pittsburgh.—Some business is being taken by the

mills for delivery later in the year, and current tonnage from the fence companies is quite heavy. There is practically no demand from fence manufacturers, as their season is closed. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in ten days:

Jobbers, carloads	\$1.70
Retailers, carloads	1.75

The above prices are for base numbers, 6 to 9.

Pumps.—The Pump market is referred to by manufacturers as being in a very unsatisfactory condition, owing to the fact that prices are extremely low and on some lines quite unprofitable. This is owing in part to the high cost of material of all kinds entering into the construction of this class of goods, coupled with animated and sometimes unreasonable competition. There are indications, however, that the manufacturers are considering the situation and endeavoring to correct it if they can existing conditions. One or two of them have withdrawn some of the extremely low prices which they have been making and some conferences have been held between others, with a view to agreeing upon some course of action that will put this line in better shape. The indications, indeed, point to the establishment of somewhat higher prices, although there are some in the trade who question the feasibility of adopting action which will give adequate relief. There is little doubt that there would be a much more satisfactory state of things in this line, as indeed in many others, if the manufacturers were definitely advised in regard to the cost of their goods. If they were in possession of this information there would be more care in making prices and the endeavor at least to avoid selling at unremunerative figures.

Paris Green.—There has been no change in the price of Paris Green since our last report. Demand continues fair, which is considered satisfactory inasmuch as the consuming demand has not yet commenced. Quotations on 5 tons and over are as follows:

Arsenic kegs.....	21 c.
Kegs, 100 to 175 pounds.....	21½c.
Kits, 14, 28 and 56 pounds.....	22½c.
Paper boxes, 2 and 5 pounds.....	22½c.
Paper boxes, 1 pound.....	23 c.
Paper boxes, ½ pound.....	24 c.
Paper boxes, ¼ pound.....	25 c.

Terms, 30 days, f.o.b. New York.

The following extras are charged for smaller quantities:

5000 to 10,000 pounds.....	½c.
1000 to 5000 pounds.....	1c.
500 to 1000 pounds.....	1½ to 2c.
Less than 500 pounds.....	2 to 3c.

Rope.—Demand is fair and manufacturers are able to ship orders for carloads without much delay. Quotations remain unchanged, as follows: Pure Manila, 12½ cents; B quality, 11½ cents; Pure Sisal, 9½ cents; No. 2 quality, 8 cents per pound.

Window Glass.—Local demand is moderate, which is more noticeable because of the heavy sales throughout the winter. At a meeting of the Eastern Window Glass Jobbers' Association held last week prices were reaffirmed as follows: Eastern district, 90 and 10 per cent. discount for all sizes of single and double strength; New York City, 90 and 10 and 5 per cent. discount for all sizes of single and double strength. The Western Jobbers' Association also reaffirmed prices last week at a meeting held in Chicago.

Linseed Oil.—Business is confined to the purchase of jobbing lots and this is moderate. Changeable and unfavorable weather for outside work has no doubt affected the demand unfavorably. The Seed market is a trifle weaker, but has had no effect upon Oil prices. Quotations are as follows: City Raw, 42 to 43 cents per gallon; out of town Raw, 39 to 40 cents per gallon. Boiled Oil is 1 to 2 cents per gallon advance over Raw.

Spirits Turpentine.—The local market during the week has been an uneventful one. Demand has been light, while prices have shown a slight decline. New York quotations are unchanged, as follows, according to quantity: Oil Barrels, 66½ to 67 cents; Machine Made Barrels, 67 to 67½ cents per gallon.

THE SENATE AND THE MAIL CONSOLIDATION SCHEME.

FROM OUR REGULAR WASHINGTON CORRESPONDENT.

WASHINGTON, D. C., May 15, 1906.

IMPORTANT developments in the campaign to secure the enactment of parcels post, post check and mail consolidation schemes have taken place during the past week, and the probabilities with regard to legislative action can now be set forth with a fair degree of accuracy. The campaign waxes warmer as the end of the session draws near, and if the combined retailers of the country, led by the Hardware merchants, win a victory it will be notable in trade annals.

A fortnight ago it was believed the annual Post Office Appropriation bill, then in the hands of the Senate Post Office Committee, would be reported within a week. The purpose was to place it on the Senate calendar so that it might be taken up immediately after the Railroad Freight Rate bill should be disposed of. Numerous delays have occurred in the framing of the last named measure, however, and the Post Office Committee has, therefore, proceeded with the consideration of the Appropriation bill in a more leisurely manner, devoting only one or two days each week to its discussion. It has now been decided to report the bill before the end of the current week, and the situation with respect to legislation favorable to the catalogue houses has therefore reached a crisis.

It can be stated on the highest authority that the Senate committee

Will Reject the Parcels Post Scheme

as embodied in the Hearst and Henry bills, and which the postal "reformers" have sought to have added to the measure as a "rider." It has also been decided not to add to the bill the provision, in line with the Post Office Department's suggestion, for an "experimental" parcels post, the committee being unwilling to enter upon such a limitless field of uncertainty, having in mind the astonishing experience that followed the \$10,000 "experimental" appropriation for the rural free delivery service seven or eight years ago.

It Has Also Been Decided

not to act upon the post check currency project in connection with the Post Office Appropriation bill. This decision has been made irrespective of the merits or demerits of the scheme, and for two reasons—first, because the committee is not convinced that there is a demand for this currency or that the pending measures are wisely drafted, and second, because under the rules of the Senate new legislation can be added to an appropriation bill only by unanimous consent, and hence if the post check project should be incorporated it could be stricken out by the raising of a "point of order" by a single Senator. It thus appears that the work of the Post Check Literary Bureau here and of the Post Office Department officials will come to naught, so far as the incorporation of the post check scheme in the pending bill is concerned.

A Grave Danger

however, still faces the retail trade in connection with the Appropriation bill. As has often been pointed out in this correspondence, the most dangerous, because the most insidious and least radical of all pending measures, is the proposition to consolidate third and fourth class mail matter, thereby reducing the rate of postage on merchandise from 16 to 8 cents per pound. The Post Office Department has urged this change in the law on administrative grounds, because it is alleged that a few postmasters have found some difficulty in properly classifying certain articles which partake of the nature of both merchandise and printed matter, like calendars, blotters, etc., and the argument has also been urged that the proposed consolidation would "relieve the pressure for a domestic parcels post."

The first reason is totally inadequate, considering the demoralization that would follow such a change in the law, and the second simply begs the whole question, for it is obvious that a reduction of one-half in the postage rate on merchandise would be to establish a limited par-

cels post, and of course such action would be followed by a demand, stronger than ever, for still further cuts in the merchandise rate.

The Post Office Department Officials

are working with great energy to induce the Senate committee to incorporate the consolidation scheme in the Appropriation bill, and there is serious danger that it will yield, rather as a mark of courtesy to the department officials than because it is convinced of the wisdom of the proposed change. It will be remembered that in the last annual Appropriation bill the Senate committee, just before reporting the measure to the Senate, added the consolidation project and also incorporated the plan devised by Mr. Bristow, then Fourth Assistant Postmaster-General, for a rate of 3 cents per pound on merchandise originating at distributing offices and delivered on rural routes. The consolidation project was killed on the floor of the Senate by a point of order raised by Senator Dolliver of Iowa, but the Bristow project was passed by the Senate and afterward thrown out upon the refusal of the House members of the Conference Committee to accept it.

In view of the situation as above set forth, it is apparent that the energies of the trade must now be directed exclusively

Against the Consolidation Scheme,

at least until the Post Office Appropriation bill has been disposed of. The officers of the Hardware associations, both national and State, are fully advised of conditions here and are heartily co-operating in the effort to induce the committee to reject the consolidation scheme. If, however, that project should be added to the bill, their efforts would be turned to the task of inducing prominent Senators to make the point of order against the amendment on the floor of the Senate. Members of the trade who desire to assist in this important work should at once write to their Senators expressing their opposition to the consolidation plan and urging them to make the point of order against it in the event that it is reported as a part of the Appropriation bill. This is a simple task, but delay or failure to call upon a considerable number of Senators to take this action may prove fatal. It should be understood that it often happens that Senators who are opposed to certain measures are unfortunately not in their seats when the particular obnoxious feature is taken up, and the discovery that it has been adopted comes too late for action. The only safeguard is to have a number of Senators on guard, so that the "rider" is sure to be thrown off before the final vote on the bill.

Retail Druggists' Association Active.

The officials of the Hardware associations who feel a heavy responsibility with regard to the pending catalogue house legislation will be greatly encouraged to learn that one of the most powerful organizations of retailers in the country, the National Association of Retail Druggists, has come out squarely against the parcels post, post check and consolidation schemes and now has its Legislative Committee in Washington fighting these projects in the most determined fashion. The organization embraces more than 30,000 members, scattered through every State in the Union, and voices the well-known views of twice as many retailers in the same trade not directly affiliated with the association. Chairman Penrose of the Senate committee has received a strong protest against these projects from the chairman of the Legislative Committee of the organization, which is in part as follows:

For the past two years the retail druggists in all sections have suffered serious inroads upon their business as the result of the development of the giant mail order houses that have cut the prices of many important articles sold by our trade to such figures as to leave no profit either for themselves or for us and to threaten the actual livelihood of many of our members. In addition we have suffered from the operations of hundreds of quacks who have sold worthless or poisonous nostrums through the mails to such an extent as to attract the attention of the Post Office Department, which after investigation has issued "fraud orders" in numerous cases denying to these parties the use of the mails.

The mail order houses and the quacks are working in perfect harmony to secure the enactment of legislation authorizing a domestic parcels post, or, failing in that, the consolidation of

third and fourth class mail matter with a reduction from 16 to 8 cents per pound in the rate on merchandise together with the passage of a post check currency bill. The absurd parcels post proposition seems to be so completely out of the question that all the energies of these parties are now centered on the consolidation and post check schemes.

The Post Office Department has been led to favor these schemes by skillfully worked up "sentiment" fostered and developed by literary bureaus maintained at great expense for that purpose. It is inconceivable that the officials of the Government would urge legislation of this character if they appreciated its probable effect upon a large and worthy class of merchants in the drug and many other trades.

An enormous increase in the sale of inferior goods and of fake medicines by mail and the ruin of large numbers of legitimate retailers would constitute the chief results of the enactment of either the consolidation or post check proposition. The passage of both would simply hasten the complete demoralization of our trade and many others.

The Dry Goods Retailers

are not behind the retail merchants in other lines, and the principal organs of the trade are making a hard fight against the projected legislation. Senator Penrose and Representative Overstreet, chairman of the House Post Office Committee, have received the following strong protest against the post check scheme from the editor of a leading journal in the dry goods trade:

Our attention has been called by publications in the daily press to the fact that the Post Office Committee has under consideration a bill prepared by the Postmaster-General for a system of postal notes, also that hearings have been given on the Post Check Currency bill, which has been pending in Congress for several years.

The retail merchants of the country are strongly opposed to these measures, which would not only injure their business but affect the prosperity of many thriving communities in all sections, for the reason that should either of these bills become a law it would have the effect of inducing a great many people who now patronize local merchants to send money away from home, especially to the big catalogue houses. The question of mail order competition is one of vital importance to the average retail merchant in all trades and one which he hopes to solve if the Government does not take the part of the mail order houses by enacting legislation in its interest.

We have had a fair trial of the postal note, which was not a success, and we believe the present money order system is entirely adequate. If there were any general demand for a postal currency the retail merchants of the country would be apt to know it. We believe the movement that has resulted in the framing of these bills was set on foot by parties working in their own interest only and that it does not represent any popular demand for legislation. We sincerely hope the bills will not be reported.

It is apparent that never before in the history of the movement for so-called postal reforms were the retail trades of the country so thoroughly united in the effort to defeat these vicious schemes. If the officers of the principal organizations receive the support of the membership of their associations to which they are entitled there need be no fear as to the outcome, but prompt action all along the line is absolutely necessary.

W. L. C.

ASSORTMENTS OF COES' WRENCHES.

THE COES WRENCH COMPANY, Worcester, Mass., the New York agents of which are J. C. McCarty & Co., 10 Warren street, and John H. Graham & Co., 113 Chambers street, New York, in line with the policy of other manufacturers, who are more and more considering the retailer's requirements, is putting up an "introduction assortment case." The case contains 1 dozen each steel handle Screw Wrenches, 6, 8, 10 and 12 inch; 2-3 dozen 15-inch, and 1-3 dozen each 18 and 21 inch sizes. The case also contains circulars and window decalcomania transfer signs and weighs 230 lbs. gross. The trade will doubtless appreciate the opportunity of obtaining the various sizes of these well-known Wrenches in this convenient form.

C. E. BONNER MFG. COMPANY, Chrisman, Ill., maker of the Victor Chain and Pipe Wrenches, has secured the services of the New England Selling Company in looking after the company's interests in the New England States. F. S. Banks & Co., New York City; Wilson B. Buck, Baltimore, Md., and Henry K. Ellyson, Richmond, Va., have also been appointed to take care of the company's trade in their respective States.

THE CLEVELAND MEETINGS.

DURING the past week meetings of the Wholesale and Retail Hardware Joint Committee and of the Executive Committee of the National Hardware Association were held at the Hollenden, Cleveland, Ohio. The Executive Committee of the Jobbers' Association met on Monday and Tuesday, 7th and 8th inst. The following members of the committee were present: P. E. Strauss, Fitz, Dana & Co., Boston; R. M. Dudley, Gray & Dudley Hardware Company, Nashville, Tenn.; A. J. Bihler, James C. Lindsay Hardware Company, Pittsburgh; W. D. Taylor, George Worthington Company, Cleveland; J. D. Moore, Moore & Handley Hardware Company, Birmingham, Ala.; Frederick Barker, Barker, Rose & Clinton Company, Elmira, N. Y.

The Joint Committee.

The sessions of the Joint Committee extended over three days, Wednesday, Thursday and Friday, May 9, 10 and 11, with the following members in attendance: S. Norvell, St. Louis, chairman; E. M. Bush, Evansville, Ind., vice-chairman; W. S. Wright, Omaha, Neb.; R. A. Kirk, St. Paul, Minn.; Samuel A. Bigelow, Boston; W. P. Bogardus, Mt. Vernon, Ohio; S. R. Miles, Mason City, Iowa; A. H. Abbe, New Britain, Conn.; W. L. Sanford, Sherman, Texas; C. B. Carter, Knoxville, Tenn.; T. James Fernley, Philadelphia, general secretary, and M. L. Corey, Argos, Ind., secretary for retail trade.

Announcement was made of the decease of T. Frank Ireland, Belding, Mich., and an appropriate resolution was adopted. A. H. Abbe, New Britain, Conn., was recently appointed to succeed Mr. Ireland on the committee. W. L. Sanford of Roberts, Sanford & Taylor Company, Sherman, Texas, was appointed to take the place of R. M. Dudley, Nashville, Tenn., who resigned owing to pressure of business. The various committees having charge of the detail work of the Joint Committee presented their reports. The work of the past year was very fully reviewed, and it was the unanimous opinion of the committee that as a result of the work performed the evil effects of the competition of catalogue houses had been greatly lessened.

The work for the next year was apportioned among the various members of the committee, the entire line of Hardware being divided into 12 classes, each member of the committee being assigned the duty of corresponding with the manufacturer in the class assigned him whose goods were still being sold at less than remunerative prices. The committee resolved vigorously to pursue the work, using, however, only moral suasion and expressing to manufacturers a preference that they should recognize only the legitimate jobbing and retail trade as distributors.

Attention was called to the Post Check bill, as recently referred to in *The Iron Age*, and a committee was appointed to visit Washington and oppose this measure as well as the various bills introduced in favor of the parcels post. C. W. Burrows, vice-president of the National Board of Trade, addressed the committee on the postal question and expressed his willingness to cooperate in the work of the committee. Mr. Norvell and the other officers were unanimously re-elected.

On Tuesday D. A. Merriman, assistant general sales agent of the American Steel & Wire Company, entertained the members of both committees at luncheon. On Wednesday they were tendered a luncheon by Geo. T. McIntosh, president of the McIntosh Hardware Corporation of Cleveland, and also visited the new wrought pipe mill of the National Tube Company at Lorain, Ohio.

J. A. CARTER, who was actively identified with the formation of the American Fork & Hoe Company, Cleveland, Ohio, and who has been its sales manager for the past four years, has resigned, to go into other business. Mr. Carter is still largely interested in the company and continues as a director.

F. A. Lamoureux has succeeded the late Henry C. Girard in the Hardware business at Lowell, Mass. Mr. Girard died on the 10th inst.

SYSTEM FOR HANDLING ORDERS.

IN our issue, 12 ult., we published an inquiry from a merchant for a good method of handling retail orders to be delivered and charged. In reply to this inquiry we have the following letter from John A. Manson of John A. Manson & Co., Burlington, Vt., whose Delivery Record was described in *The Iron Age* several months since:

Answering your correspondent in *The Iron Age* of April 12 regarding the subject of handling orders to be delivered and charged: He has touched on one of the most important matters in the retail trade, for over half of the average Hardwareman's business is delivery of some kind—orders by telephone, orders taken by clerks and orders received by mail—some of which are charged, some paid and some to be paid when delivered. Goods to be called for by customers at some later time than when ordered should also be handled as delivery transactions.

In addition there are occasionally goods to be credited to a customer for which the dealer has to call at the customer's house now and then, a no-charge transaction or a transaction that becomes void through nonability to fill. Some method to safeguard these varied transactions and insure prompt and definite results and to prove that no goods are being delivered without having been charged or paid for is most important in these days of sharp competition and close profits.

Soon after starting in business I felt the need of some kind of register, follow up and check off on all delivery

be called for. It may be added that Mr. Manson has received a number of letters from firms who have his Delivery Record in use in which its efficient working is emphasized.

NORWICH INDUSTRIAL EXHIBITION.

AN industrial exhibition was held in the State Armory at Norwich, Conn., during the week ending May 12, under the auspices of the Norwich Board of Trade, the object being to acquaint the citizens of that city with the products of the manufacturing establishments located there, and local manufacturers incurred considerable expense in preparing attractive displays of their products. The exhibition was largely attended by the citizens of Norwich and has attracted widespread attention, on account of the novelty of the idea. Among the exhibitors were Hopkins & Allen Arms Company, Rifles, Shotguns and Revolvers; the W. H. Davenport Firearms Company, the Crescent Firearms Company, the Tobin Arms Mfg. Company, Hammerless Shotguns; the Ossawan Mills Company and the Emerson P. Turner Mfg. Company, Bright Wire Goods, Picture Hooks, &c.; Chelsea File Works, Hand Cut Files; the Bard Union Company, Pipe Unions; Norwich Nickel & Brass Company, Window Display Fixtures; Norwich Cutlery Company, Table Cutlery;

DATE	WHO	WHAT	WHERE	WHEN	DELIVERY			TRANS-ACTION	REVIEW CHECK
					WHEN	HOW	CHECKED BY		
May 25	H. E. Thomas	Tools	99 Hickok St	9 Am	9 Am	Hander	Pronty	P	5/25
	Otter Lumber Co.	Order No. 5741	Mill	10 Am	10 Am	Minor	Pronty	C	5/25
	R. J. Jones	Roofing for credit	16 Elm St	to-day	3 Pm	Hander	Pronty	R	5/25
	J. M. Godfrey	Machine screws	86 Penn St	Am		Void		V	5/25
	Simons & Rand	Belting - due \$6.25	D. B. Co. I.	to-day	4 Pm	Simons	Pronty	P	5/25
	Richards Mfg. Co.	Nails & Hangers	Shelburne Vt. 61 ft	to-day	4 Pm	Minor	Pronty	C	5/25
	Horace Black	Paints	D. B. Co. I.	to-day	2 Pm	Self	Pronty	C	5/25
	Geo. Kalton	Shovels	D. B. Co. I.	soon		Forward		F	5/25
	J. Lafrance	Lawn Mowers, collect \$1.00	26 Allen St	3 Pm	3 Pm	Hander	Pronty	P	5/25
	Mrs. G. Henry	Sad prons - in exchange	D. B. Co. I.	Am	4 Pm	Self	Pronty	N	5/25
	James Drew	Pack Sawsets	3 Buell St	Am	3 Pm	Jones	Pronty	C	5/25
May 26	Geo. Kalton	Shovels	D. B. Co. I.	soon				C	

Manson's Delivery Record, Showing Transactions Checked in Full.

transactions, something that would be thoroughly adaptable to a moderate sized business and prove that all delivery transactions were appearing in the charges and cash sales. Being unable to find on the market just what seemed necessary, I finally developed after considerable test and practical application Manson's Delivery Record,* which was described with illustrations in *The Iron Age* of January 11 last.

As of interest in this connection we take pleasure in giving herewith one of the illustrations which were used in the article descriptive of the Delivery Record, to which Mr. Manson refers. This illustration shows the Record filled out with all the entries successively made in the different stages of the transaction. It will be readily understood that "Who," "What," "Where" and "When" signify respectively the customer, goods ordered, place of delivery and the time goods are wanted. Under "Delivery" "When" represents the time of delivery; "How" the name of the carter, messenger or customer who took the goods, or if they were sent by express, freight or mail; and "Checked By" the name of the employee who checked the goods out of the store. Under "Transaction" C stands for charge, P for payment, R for goods returned for credit, N for no charge, V for void, F for forward. "T B C F" in the "Where" column indicates that goods are in the store and are to

* Published by David Williams Company, 14-16 Park place, New York. Canvas cover, \$1. Heavy manila cover, 60 cents.

Atlas Radiator Pedestal Company; Parker, Preston Company, Stains and Fillers; Ulmer Leather Company and Norwich Belt Mfg. Company, tanners and manufacturers of Leather Belting; W. H. Page Boiler Company and the Kellogg-McCrum-Howell Company, Heaters, &c.

SAN FRANCISCO NOTES.

Ralph Brown of the Ralph Brown Company is about to return to San Francisco, having substantially completed the arrangements with manufacturers for the making of which he came East. He expresses himself with much appreciation in regard to the sympathy and the substantial help extended to his company by manufacturers and the trade in general, and expects within a few weeks to resume business with a larger assortment than before. Many of the company's goods are already on their way West.

The Osborn Hardware & Tool Company, formerly located at 414 Market street, San Francisco, Cal., desire to announce that their store was destroyed by fire and that they have reopened at 517 Golden Gate avenue, San Francisco, where they will be pleased to receive catalogues and discount sheets from the different Eastern manufacturers.

TRADE WINNING METHODS.

This department is for the description of approved methods of carrying on and extending business, and a cordial invitation is given to merchants to co-operate in the effort to make it suggestive and of practical use to the trade.

HOUSEHOLD HARDWARE.

THE following list of articles in the line of Household Hardware is contained in the April number of *Hardware Hints*, published by Logan-Gregg Hardware Company, Pittsburgh, Pa., with suggestion that the house cleaning season and moving time afford opportunities of which every live Hardware merchant should take advantage. We reproduce the list, as likely to be suggestive to some of our readers in regard to the special assortment of goods included in it, while at the same time the query will naturally arise as to what special means should be employed to bring these goods to the attention of their trade, or in some way to make the most of the opportunities for their sale at this season:

Apple Parers.	Filters.	Paints.
Baby Carriages.	Flour Bins.	Paint Brushes.
Bathroom Fixtures.	Flour Sifters.	Pastry Boards.
Brass Headed Tacks.	Fly Pans.	Picture Hangers.
Bread Makers.	Food Choppers.	Picture Wire.
Bread Toasters.	Furniture Polish.	Potato Mashers.
Brooms.	Garbage Cans.	Pot Cleaners.
Butcher Knives.	Gas Brackets.	Pot Covers.
Carpet Beaters.	Gas Burners.	Rat Traps.
Carpet Stretchers.	Gas Mantles.	Refrigerators.
Carpet Sweepers.	Gas Ranges.	Rolling Pins.
Carpet Tacks.	Gas Tubing.	Scissors.
Chair Seats.	Gasoline Stoves.	Screen Doors and
Cherry Seeders.	Glue.	Windows.
Churns.	Hot Plates.	Scrub Brushes.
Clocks.	House Figures.	Sewing Machines.
Clothes Bars.	Ice Cream Freezers.	Shoe Blacking.
Clothes Baskets.	Ice Picks.	Shoe Brushes.
Clothes Lines.	Irons.	Sink Strainers.
Clothes Line Hooks.	Ironing Boards.	Soap Dishes.
Clothes Pins.	Kitchen Knives.	Spoons.
Coat Hangers.	Kitchen Saws.	Step Ladders.
Coat and Hat Hooks.	Knife Sharpeners.	Stove Mats.
Cooking Utensils.	Knives and Forks.	Stove Pipe.
Coolers.	Lamps.	Stove Pipe Collars.
Cork Screws.	Lamp Chimneys.	Stove Polish.
Cover Knobs.	Lemon Squeezers.	Table Oil Cloth.
Crockery Mender.	Lid Lifters.	Tack Claws.
Curtain Stretchers.	Linoleum.	Tack Hammers.
Cuspidors.	Market Baskets.	Thermometers.
Door Keys.	Match Boxes.	Tile-Like.
Door Latches.	Metal Polish.	Tin Ware.
Door Locks.	Mirrors.	Towel Rollers.
Door Springs.	Mops.	Trouser Hangers.
Dust Pans.	Mop Wringers.	Twine.
Electric Door Bells.	Mouse Traps.	Waffle Irons.
Electric Lamps.	Night Latches.	Wall Paper Cleaner.
Enameled Sinks.	Oil Cans.	Wash Boards.
Enameled Ware.	Oil Cloth.	Washing Machines.
Family Grindstones.	Oil Stoves.	Wash Tubs.
Family Scales.	Ovens.	Window Cleaners.
Feather Dusters.	Padlocks.	Window Glass.
		Wood Pails.

LAWN MOWER WINDOW DISPLAY.

A SIMPLE and convenient, but very effective method of displaying samples of Lawn Mowers has been observed in some of the metropolitan Hardware stores. This consists merely in covering the floor or ledge of a show window with imitation grass made of green paper on which the machines can be arranged in a way suggestive of actual use. The appearance of realism may be increased by the use of a clothier's dummy, shirt-sleeved, but immaculate, illustrating the ease with which a merchant's particular brand of Mower may be operated. Such a window is attractive in its suggestion of spring and on account of the handsome appearance of the brightly painted machines.

CHATTANOOGA SPRING OPENING.

F. H. WOODWORTH & Co., Chattanooga, Tenn., conducted a very successful "spring opening" (their first) on the 3d, 4th and 5th inst., during which their handsome store was visited by a multitude of people, the ladies predominating. The store was appropriately decorated, and souvenirs were distributed from daintily constructed booths. Probably the most attractive of the souvenirs was a cook book, of which many hundreds of copies were given out. The presence of an orchestra contributed an enlivening effect to the occasion. A feature of the opening was a "cozy corner,"

with easy chairs, writing tables, mirrors, &c., for the comfort of the women visitors. This made such a hit that it will be a permanent fixture of the store.

TRADE ITEMS.

OELSCHLAGER BROS., formerly at 42 East Twenty-third street, New York, have just moved into a new building at 110 East Twenty-third street, but a few doors from the Subway station, where they have largely increased facilities. This well-known house are importers and wholesalers of thermometers, barometers, hydrometers and similar registering instruments, surgical instruments and various articles of precision, including large lines of fine optical goods. They represent in this country several well-known foreign manufacturers, including James J. Hicks, 8, 9 and 10 Hatton Garden, London, E. C., England.

E. C. Atkins & Co., Indianapolis, Ind., had a branch house at 21 and 23 Main street, which was located right in the track of the conflagration, and the building and stock, consisting of a complete line of circular, band, cross-cut, hand and other saws, mill specialties, &c., was a complete loss. R. W. Neighbor, the energetic San Francisco manager, opened a temporary office at 1055 Broadway, Oakland, and was ready for business on the 20th ult. N. A. Gladding, vice-president and secretary of the company, who has just returned from a trip to the stricken city, after studying the situation carefully decided to lease a warehouse at 862 Market street, Oakland, which will be the San Francisco branch until further notice. Mr. Gladding was fortunate in securing large, well lighted premises, with ample room and admirably adapted to the company's needs.

THE BENEDICT & BURNHAM MFG. COMPANY, long at 353 Broadway, New York, but which on succeeding to the business of the Holmes, Booth & Haydens Company some months ago moved to that company's New York address, 37 Park place, has now taken the ground floor of the building at 99-101 John street, corner Cliff street. The leading articles of the company's product are Sheet Brass, Wire Rods, Seamless and Barrel Tubing, Bare and Insulated Copper Wire and McGill's Patent Fasteners for holding papers, textiles and kindred substances together.

THE NEW YORK ASBESTOS MFG. COMPANY, 80 John street, New York, is now the New York agent for Ehret's 85 per cent. Magnesite Pipe Coverings and carries a stock of 50,000 feet, with which to promptly execute orders. It will be recalled that the asbestos covering business of F. J. Gast, formerly at 37 Dey street, was consolidated with that of the New York Asbestos Mfg. Company of Long Island City, N. Y., and continued as the New York Asbestos Mfg. Company after removal to the above address, with F. J. Gast as general manager. The business is being continued on the same lines as previously conducted.

THE ABERCROMBIE & FITCH COMPANY, which recently moved from 314 Broadway, around the corner to 57 Reade street, New York, where it now occupies exclusively a large building, has just issued a new copyrighted catalogue and price-list of the goods it manufactures and deals in. In the 320 pages are included complete outfits for explorers, campers, prospectors, hunters, &c. It is an exhaustive catalogue along these lines, and contains a wide variety of such paraphernalia, from Tents, Cook Stoves and Nested Kits to Rods, Fishing Tackle, Clothing, Leather Goods, Condensed Food and Ammunition.

CHARLES J. GODFREY & Co., formerly at 4 Warren street, New York, have moved to 111 Chambers street, where they now have the store floor and two basements, formerly occupied by the Whitman & Barnes Mfg. Company, which will continue to have office quarters on the premises. This and other removals of Hardware concerns in that vicinity was necessitated by the razing of several buildings to provide a site for a new office building on the northwest corner of Broadway and Warren street. This well-known house sells all kinds of Sporting Goods, Arms, Ammunition and Tourists' and Camping Outfits of every description.

THE LATE ROBERT SICKELS.

AT a meeting of the Board of Governors of the Hardware Club of New York, held May 15, the following memorial to the late Robert Sickels, reported by a committee consisting of Joseph Gales, E. C. Van Glahn and R. R. Williams, was adopted as a tribute to his memory:

IN MEMORIAM

ROBERT SICKELS, A GOVERNOR OF THE HARDWARE CLUB, DIED APRIL 11, 1906.

Mr. Sickels was born of Dutch ancestry in Albion, N. Y., April 15, 1833, and after receiving such schooling as was necessary to fit him for a business life he began his career as a clerk in a general store in his native town. After a short time spent in learning the fundamental principles of a successful business career he removed to Davenport, Iowa, to look after his brother's interest in a Hardware house in that city.

Mr. Sickels soon decided to make Davenport his home, and in 1863 formed the firm of Sickels & Preston, which in 1881 became and now is Sickels, Preston & Nutting.

In 1890 Mr. Sickels decided to establish himself in business in New York City, and in addition to his Western house started the concern now known as Sickels-Nutting Company, with which he was actively identified up to the time of his death. Such, briefly stated, was the business career of Robert Sickels.

For 43 years Mr. Sickels was an honored member of the Hardware trade. He was also a member of the Hardware Club from its beginning, and since 1899 a member of its Board of Governors.

Although he has passed from among us and his calm, dignified countenance will no more be seen to lighten up this place, which for so many years was his club home, yet his genial personality, his kindness of manner and his affable greeting will long be missed by his fellow members, while those who through many years of business intercourse, and in the closer ties of friendship, had learned to know him intimately, will hold him in peculiarly warm and affectionate remembrance.

As a business man he was broad minded, progressive and just; devoted to the principles of truth and honor, his life being actuated by high moral purposes. By his courage, his ability, his loyalty to truth and his fidelity to every trust committed to his care he achieved success.

As a citizen he was patriotic and public-spirited. He formed his opinions after wide reading and careful thought, and gave his unwavering support to every cause which he conscientiously believed would benefit his country, his State or his city.

As a friend he was gentle, considerate and staunch. He was an inspiration to all that was lofty and noble and true, and a rebuke to whatever was base, selfish and unworthy.

While business was his pursuit, truth, honor and Christian virtues were his passion. He was ever true to his high ideals, and often expressed his firm faith in the all-controlling goodness and providence of God. In that faith he lived and died.

During the last few months of Mr. Sickels' life, amid physical infirmities always bravely borne, his interest in all good works, his love for his friends and his devotion to this club were as real as when he first came to New York and made his strong, manly presence felt among us.

His character and career will be an inspiration to all who knew him, who will remember him as a courteous, Christian gentleman, whose congenial companionship, sound judgment and unwavering fidelity they will sadly miss.

OLIVER BROS.' NEW PITTSBURGH BRANCH.

OLIVER BROS., 127 Duane street, New York, buyers of Hardware and related lines for various well-known wholesale houses, have just opened a branch office in the Frick Building Annex, Pittsburgh, Pa., which will be under the direct supervision of George Piper, who until recently was the manager of R. K. Carter & Co.'s Pittsburgh office. The establishment of this new office has become necessary on account of the increased tonnage of purchases of Iron, Steel and Heavy Hardware lines in Pittsburgh territory. Another important reason for opening the office was to serve the convenience of their Western and Southwestern connections, who can now carry on correspondence with Pittsburgh and save much time as against New York. During the last two years Oliver Bros.' Heavy Hardware business has increased very materially. All accounts will be kept in New York as heretofore. James T. Sullivan, formerly assistant manager of R. K. Carter & Co.'s Pittsburgh office, has taken the position of assistant buyer in Oliver Bros.' New York office.

GEORGE E. STERNBERG, who for the past 15 years has been connected with the Peck, Stow & Wilcox Company at the New York branch, has identified himself with the Biddle Purchasing Company, 78 Reade street, New York.

PRICE-LISTS, CIRCULARS, &c.

Manufacturers in Hardware and related lines are requested to send us copies of catalogues, price-lists, &c., for our catalogue department in New York; and at the same time to call our attention to any new goods or additions to their lines, of which appropriate mention will be made, besides the brief reference to the catalogue or price-list in this column.

ANDERSON TOOL COMPANY, Anderson, Ind.: Catalogue illustrating Computing Cheese Cutters, Computing Oil Tank, Anderson Slot Machine, Computing Scoop, Computing Scales, Crescent Putty Knife, &c.

W. P. MARKLE & Co., St. Louis, Mo.: Descriptive illustrated catalogue of Rapid Repair Mill, designed for resizing, decapping, recapping and ironing Shells preparatory to reloading.

THE KIRK-LATTY MFG. COMPANY, Cleveland, Ohio: Juvenile vehicle department catalogue, devoted to Juvenile Automobiles, Children's All Steel Express Wagons, Velocipedes, Toy Garden Barrows, Cycle Wagons, Hand Cars, Coaster Wagons and Bob Sleds, Lamps, Horns, &c.

ELLWOOD IVINS TUBE WORKS, Philadelphia, Pa.: Tag with small samples of Seamless Steel Tubing. The company manufactures Low Carbon Steel, Tool Steel, Aluminum, Copper and Brass Seamless Tubing.

PATTERSON-SARGENT COMPANY, Cleveland, Ohio: Attractive color card of B. P. S. Paint, with valuable directions, suggestions and don'ts for painters.

N. Y. & N. J. LUBRICANT COMPANY, 14 Church street, New York: Booklet referring to Nonfluid Oils; also circular describing the Philadelphia cup for nonfluid oils.

CHILTON PAINT COMPANY, 100 William street, New York: Handsome color card of Chilton Mixed Paints, including directions and hints to painters.

REQUESTS FOR CATALOGUES, &c.

The trade is given an opportunity in this column to request from manufacturers price-lists, catalogues, quotations, &c., relating to general lines of goods.

REQUESTS for catalogues, price-lists, quotations, &c., have been received from the following houses, with whom manufacturers may desire to communicate:

FROM TIMKEN & MONEY, who have purchased the business of J. C. Meyer & Co., in Bison, Kan. They will conduct a retail business, carrying Shelf and Heavy Hardware, Stoves, Tinware, Agricultural Implements, Paints and Oils.

FROM THE WILSON & HUDSON COMPANY, Wilmington, Del., which has been incorporated with capital stock of \$50,000. The company is successor to Wm. Wilson, Jr., and in addition to acting as manufacturers' agent, will carry a stock of Shelf and Heavy Hardware, Paints, Oils, Bar Iron and Steel, Carriage Hardware and Contractors' Supplies.

FROM GLOBE HARDWARE COMPANY, Globe, Ariz., which has taken over the stock formerly carried by Jacob Suter. The lines handled embrace Hardware, Tinware, Stoves, Wagons, Harness, Plumbing Supplies, Mining Supplies, Engineers' Tools, &c.

FROM NITARO KAJI, 10, Kodenma-Uwacho, Tokio, Japan, who desires catalogues and quotations on general Hardware, Tools and Machinery.

FROM GENEVA MERCANTILE COMPANY, Geneva, Ala., which intends adding a line of Hardware to its business.

FROM THEO. HEURLIN, Swedeburg, Neb., who has opened a Hardware, Stove, Paint and Sporting Goods store.

FROM C. S. PRICE & BRO., Eaton, Ohio, who have added to their stock a line of Hardware, Stoves, Roofing, &c.

The Hardware Store of Neal & Brinker Company.

SEVENTH ARTICLE.

PHOTOGRAPHS reproduced with former articles of this series showed the wall cases on either side of the Hardware store of Neal & Brinker Company, New York, near the entrance, and afforded a general view of their contents. They are used to accommodate an extensive line of Tools, especially those which, on account of their size and shape, are better adapted to hanging on hooks, racks, &c., than to any other method of arrangement or display. These cases are among the most promi-

ferent hights, so as to bring the handles in a vertical line. Hammers of various designs and sizes, Fig. 49, are aligned in the same way. Fig. 48 also shows the

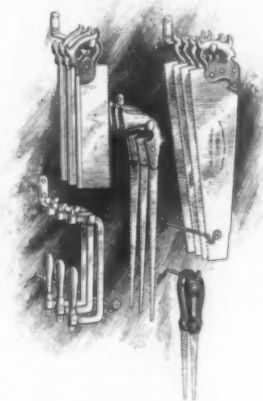


Fig. 47.—Saws in Wall Case Held in Perpendicular by Wire Rods.

nent and effective fixtures in the store, presenting their contents to the eye in an exceedingly attractive and comprehensive way. They are lined with black cloth, providing a rich background, which sets off to the best possible advantage the bright metal heads and blades of the Tools. The cases are divided into sections, each inclosed in front by a sliding glass door containing a single light of glass, this affording an unobstructed view of the goods. As far as practicable each section is entirely devoted to a separate line.

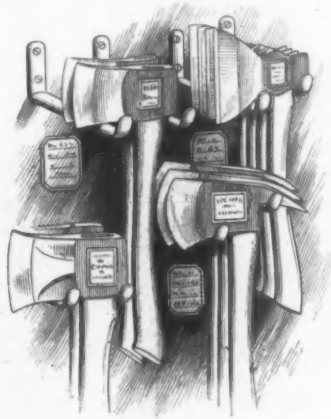


Fig. 48.—Axes and Hatchets Hung on Pairs of Harness Hooks Set at Different Heights.

Most of the samples are suspended from harness hooks, 8 inch or 10 inch hooks being used, according to the size or number of the goods. Care is taken to secure a symmetrical arrangement, so that the general effect of each line shown will be uniform and pleasing to the eye. Where the shape or balance of the Tools is such that they do not naturally hang in a perpendicular manner they are held in place by rods projecting from the wall, as in the case of Saws and Saw Frames, Fig. 47, thus giving them an orderly appearance. Similarly, in hanging Axes and Hatchets, Fig. 48, their heads are rested on two hooks set on either side of the handles at dif-

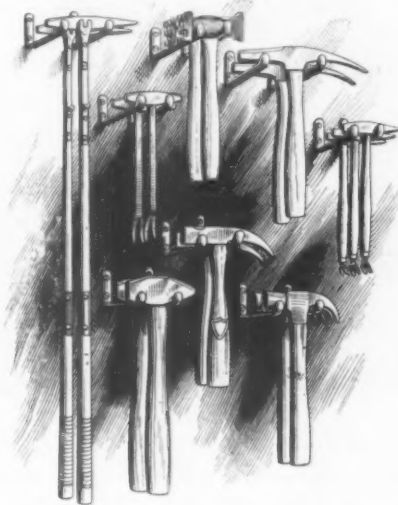


Fig. 49.—Hammers Suspended from Harness Hooks.

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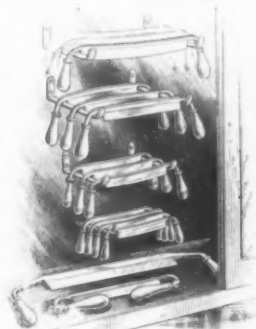


Fig. 50.—Drawing Knives in Wall Case.

price labels, which are pasted on the back of the cases beside the goods to which they apply. Drawing Knives, Fig. 50, and Bit Braces, Fig. 51, are hung on pairs of

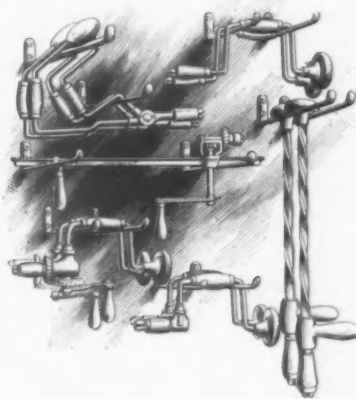


Fig. 51.—Bit Braces Suspended from Harness Hooks.

hooks, set the proper distance apart to accommodate the different sizes. Some of the extra large sizes and special designs are placed on the floor of the case, either lying flat or leaning against the wall. Adzes with handles detached are also placed on the floor of the case, being arranged in a double row, one overlapping the other,

with the larger sizes on the inside, as shown in Fig. 52. This cut also illustrates the price labels pasted on the

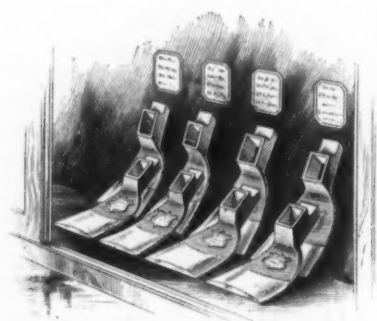


Fig. 52.—Adzes on Floor of Wall-Case with Handles Detached.

back of the case, in connection with Tools of different kinds and sizes.

(To be continued.)

NEW BUILDING FOR BOSTWICK-BRAUN COMPANY.

THE BOSTWICK-BRAUN COMPANY, Toledo, Ohio, has decided to erect a new establishment which will rank among the largest jobbing plants in the country. The new building will be eight stories in height and will cover a block. It will be the largest structure in the city and one of the most capacious in the State. Of reinforced concrete construction, the plans call for a building which will be especially handsome in appearance. To meet this expenditure the company will increase its capital stock from \$300,000, as at present, to \$700,000, \$350,000 common stock and an equal amount of preferred. The common stock will be taken up by the present stockholders, while the preferred will be disposed of to a number of the most prominent and conservative business men of Toledo. The company intends to have all the old buildings removed from the site which has been purchased, and the excavation and piling completed this fall, so that a start may be made on the new structure in the spring of 1907.

HARMON & DIXON'S NEW QUARTERS.

HARMON & DIXON have just moved from 100 Chambers street, New York, to 117, across the street, on the block below. They have the street floor and two basements, each 25 x 90 feet. The reason for the removal from their old quarters, where they had been for ten years, was the necessity for much more room than they then had in order to accommodate the goods of the Minnesota Mining & Mfg. Company, Duluth, Minn., which mines and manufactures Crystal Bay Corundum Paper and Cloth, Garnet Paper and Cloth and Emery Paper and Cloth. This concern is comparatively new, having started in business last October. There are now two carloads of these products on the way East with which to make a start, and it will be the endeavor of the firm always to keep on hand an adequate supply from which promptly to execute orders. Harmon & Dixon are also the representatives in this city of the Penn Hardware Company, National Screw & Tack Company, National Acme Mfg. Company, Cap and Set Screws; Taunton Rivet Company, Hale Bros. Company, Jack and Ladder Chains; J. M. Russell Mfg. Company, Sash, Safety and Plumbers' Chains; Star Lock Works, American Metal Polish Company, American Bit Brace Company, National Brass & Iron Works, Lamps, Gas and Electric Fixtures, &c.; E. H. Titchener & Co., Poultry and Blind Staples; United States Wire Mat Company, and W. H. Rankin Company, manufacturer of Tar and Building Papers, &c.

E. DE FOREST SHELTON, president and treasurer of the Shelton Company, Shelton, Conn., which manufactures various kinds of Tacks, sailed for Europe May 5, accom-

panied by his family. Mr. Shelton will spend the summer abroad in recreation and recuperation, largely in Florence, Italy.

THE BURNS PIPE PRICE EXTENDER.

THE DAVID WILLIAMS COMPANY, 14-16 Park place, New York, has issued a little book which is expected to prove of value to all interested in the sale or purchase of black and galvanized merchant pipe. The book consists of a series of tables giving the exact list price of pipe of any length from 1 to 100 feet. The calculations have been made on the basis of sizes extending from 1/8 inch to 12 inches in diameter. The typographical scheme of the tables will be clear from the accompanying reproduction of the first page. It will be observed that the upper part of the page refers to lengths in feet and the lower part to lengths in inches. The arrange-

No. FEET.	1/8-1/4-3/8	1/2	3/4	1
1	.055	.085	.115	.165
2	.110	.170	.230	.330
3	.165	.255	.345	.495
4	.220	.340	.460	.660
5	.275	.425	.575	.825
6	.330	.510	.690	.990
7	.385	.595	.805	1.155
8	.440	.680	.920	1.320
9	.495	.765	1.035	1.485
10	.550	.850	1.150	1.650
11	.605	.935	1.265	1.815
12	.660	1.020	1.380	1.980
13	.715	1.105	1.495	2.145
14	.770	1.190	1.610	2.310
15	.825	1.275	1.725	2.475
16	.880	1.360	1.840	2.640
17	.935	1.445	1.955	2.805
18	.990	1.530	2.070	2.970
19	1.045	1.615	2.185	3.135
20	1.100	1.700	2.300	3.300
21	1.155	1.785	2.415	3.465
22	1.210	1.870	2.530	3.630
23	1.265	1.955	2.645	3.795
24	1.320	2.040	2.760	3.960
25	1.375	2.125	2.875	4.125

No. INCHES.	1/8-1/4-3/8	1/2	3/4	1
1	.005	.007	.010	.014
2	.009	.014	.019	.028
3	.014	.021	.029	.041
4	.018	.028	.038	.055
5	.023	.035	.048	.069
6	.028	.043	.058	.083
7	.032	.050	.067	.096
8	.037	.057	.077	.110
9	.041	.064	.086	.124
10	.046	.071	.096	.138
11	.050	.078	.105	.151

Fac-Simile of First Page of Burns Pipe Price Extender.

ment is such that the price can be found instantly for any length of pipe of any size, thus avoiding the constant calculations which are now necessary, as well as the liability to errors. The book also contains directions for its use, which are very simple and thus easily understood.

The author of the work is Eugene Burns, a practical bookkeeper of long experience, who prepared the tables for his own use, and, finding them of great assistance in saving labor and insuring accuracy, decided to make his work available for the trade in general. The book is of pocket size, and can thus be carried conveniently by those who have occasion to use it when away from their offices, and it also requires little room for desk use. It is recommended to all who have occasion to make calculations of the cost of pipe, whether they are manufacturers, merchants, salesmen or buyers. The price has been fixed at 50 cents per copy.

NATIONAL CUTLERY COMPANY'S NEW PLANT.

THE NATIONAL CUTLERY COMPANY is now occupying its new and modern factory at Lawton avenue and the Michigan Central Railroad tracks, Detroit, Mich. It consists of four buildings, three of which are 40 x 200 feet. The fourth is 40 x 100 feet, but the company expects shortly to make this the same size as the other buildings. Built of white sand brick light is well reflected from one building into another. The entire plant is of single story construction, with a 3-foot brick wall and glass to the roof, which is supported by 12-inch brick columns 8 feet apart. All buildings are connected by two passages of 10 feet inside measurement and are separated from each other by a 20-foot light space. The company has equipped this plant with machinery entirely modern, and in the new factory has combined the old plant, formerly located at Bates and Atwater streets, and the Axe factory, formerly located at Eaton Rapids, Mich. The company manufactures Axes, Butcher Knives, Hatchets, Scythes, Cold Chisels, &c.

MISCELLANEOUS NOTES.

Special Wires, Spooled and Cut.

Russell Fraser, 128 Wythe avenue, Brooklyn, manufacturer of various kinds of spooled and cut wires, makes a specialty of covered wire for milliners, artificial flower work, &c., and what is known as chenille wire, which he furnishes to the chenille manufacturers. He also supplies largely wire to be used in bottling various liquids and beverages and a special wire for bookbinders. Another specialty is a retailer's stock of spooled wire in a hinged cover compartment box, containing 147 small spools, the gauges of which run from Nos. 18 to 34 in best selling sizes and the kinds including black and tinned annealed steel wire, soft copper and soft brass wires, which are listed to aggregate \$11.10 at retail on a cost less than one-fifth of that. Still another wire specialty is Fraser's belt lace. This is made of uncovered soft brass wire, and put up conveniently on black enameled spools, 2½ x 1½ inches in dimensions. This material is used for lacing machinery belts, end to end, and is made in three sizes. No. 1 is for belts 6 inches wide or over, or smaller belts under unusual strain. Its breaking strain is 250 pounds, and the gauge is No. 19. No. 2 is for belts 3 to 6 inches wide, the breaking strain of this wire, No. 18 gauge, being 220 pounds. No. 3, No. 17 gauge, is for belts less than 3 inches wide, and the breaking strain is 135 pounds. All are put up in 50-foot lengths, and accompanied with instructions as to proper method of lacing to obtain the best results.

Cronk & Carrier Mfg. Company.

The Cronk & Carrier Mfg. Company, Elmira, N. Y., has very much improved its No. 80 lineman's pliers. The style is unchanged, but the material now used costs the company about double that formerly used, making the pliers stronger and better in every way. The company has added an onion hoe to its line, much the same as its No. 2 weeding hoe, having, however, a narrower blade. Last summer an addition was made to the company's factory, but increasing business demands more room, which will be provided by enlarging the plant during the coming summer.

The Star Razor Hone.

Star Corundum Wheel Company, Detroit, Mich., is now making a razor hone in one size only, 5 x 2 x 2½ inches, which will work either wet or dry. The hones are made with a view to meeting a demand for a fast cutting hone and yet one which leaves a smooth, sharp edge.

The Gem Finger Nail Clipper.

The Gem Finger Nail Clipper, manufactured by the H. C. Cook Company, Ansonia, Conn., is composed mainly of a rigid member and a spring member integral at one point, also an operating lever and cutting jaws. It is explained that the action of the lever being pivoted to the rigid parts near the cutters is such as to transmit rigidity

to the spring member without in any way destroying the life of the spring or its alignment, and that herein lies the secret of success of the clipper. Continued wear, it is stated, never affects the alignment, and with proper use the jaws will remain sharp for years. It is pointed out that two cutters passing each other, or shearing, will dull themselves by continual rubbing, while two cutters brought together squarely, as in the case of this clipper, will continue to do their work without injury to either jaw.

New Screw Cutting Tools and Machines.

The E. F. Reece Company, Greenfield, Mass., has added to its line full mounted screw plates, the distinctive feature of which is that no changing of dies is required, as a stock is provided for each die. New model screw plate sets have also been added, differing from the company's assortment in that plug and bottoming taps are furnished. In addition to taper taps, with each size. A new line of tap wrenches is also announced, having tool steel jaws, knurled handles and adjustable. The line of bolt cutters and nut tappers has been increased by the addition of A 1 and B 1 machines. These are intended for use in blacksmith and repair shops, and the taps and dies furnished with these machines are the same as the company sends out with the screw plates.

Ruberoid Red and Brown Roofing.

The Standard Paint Company, 100 William street, New York, along with other specialties of this character, manufactures Ruberoid roofing in red and brown color, which is offered as a durable, high grade article. Among its characteristics mentioned by the company are that the color which glistens is the same all the way through; that it is a permanent roofing having a color that will hold, and is about ¼ inch thick. It is put up in rolls of 216 square feet, in 36-inch widths, 16 square feet being allowed for laps and seams.

Navalite Conduit Pipe.

Mark Mfg. Company, Chicago, Ill., is introducing Navalite conduit for race way for electric wiring in buildings. The company explains that the proper steel is used to insure easy and safe bending, that each length is properly welded, that threads are perfectly cut to standard and that the pipe is thoroughly cleaned of all burrs, scales or silicates before enameling. Enamel compound is applied in two coats and is elastic. It is pointed out that the enamel is also weather, water, acid and alkali proof, and noncorrosive under all conditions. Elbows and couplings are also enameled.

Massachusetts Tool Company.

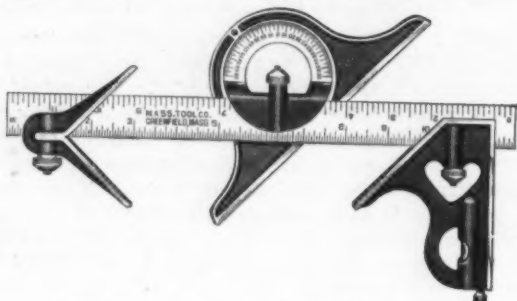
Massachusetts Tool Company, Greenfield, Mass., has issued a new edition of its catalogue No. 4, styled No. 4 A. The book is similar in size to the former edition, but covers several improvements and additions to the line which will be of interest to the trade. Under the head of Micrometers may be noted the addition of the 4 and 5-inch sizes, the addition of Micrometer Heads and improvements in Nos. 14 and 15. A No. 19 inside Micrometer Gauge has also been added, having a limit of measurement from 3 to 18 inches. A new line of metric graduation Rules has been added, of approximate width of ⅝-inch and 1-100 inch in thickness. Combination Squares have been improved. Combination Sets and Bevel Protractors have been added; also Screw Pitch Gauges Nos. 137 and 138, and Surface Gauges Nos. 115 and 116.

Greystone Mfg. Company.

The Greystone Mfg. Company, Greystone, Conn., is manufacturing a line of Stanley safety swivel and safety snaps made of forged steel, without rivets or bolts, holding the swivel eye and spring so that they will work automatically and stay in place. The spring is constructed so as to work vertically only. The company has recently added a line of new split rings, made in steel, German silver and German silver plated; also Housekeepers' chatelaine key chains.

Combination Square and Bevel Protractor.

Massachusetts Tool Company, Greenfield, Mass., is introducing the combination square and bevel protractor shown in the accompanying illustration, made in 9, 12, 18 and 24 inch sizes. The device can be used, as shown, as a combination square or as a bevel protractor. The blades are of crucible steel with a spring temper and are accurately graduated. They are fastened to the heads by round cornered bolts, which slide in a round clamping



Combination Square and Bevel Protractor.

groove in the blade. The heads are of steel, designed so as to give the most rigid working surfaces without cumbersome weight, and accurately made with ground angles. They are finished in black enamel in recessed parts and polished on all wearing surfaces. The blade is held in a revolving turret of the bevel protractor by a round ended bolt. The turret is accurately fitted, and engine graduated to 90 degrees either side of zero, care being taken to insure its being at right angle to the face of the head. It carries a level, set and fastened to the side of the turret.

Ely's Dandy Mop and Brush Holder No. 15.

Theo. J. Ely Mfg. Company, Girard, Pa., is offering the mop and brush holder shown herewith. The head is all of malleable iron castings, fitted with No. 9 wire. All metal parts are tinned. A heavier holder, No. 6, of the



Ely's Dandy Mop and Brush Holder No. 15.

same pattern, is made, on which No. 7 wire is used. The one illustrated is made to supply the demand for a cheaper article.

Westinghouse 1906 Model Electric Fans.

Westinghouse Electric & Mfg. Company, Pittsburgh, is offering this season an increased assortment of electric fans for desk, bracket, ceiling, floor, column and counter use. Three types are shown in the accompanying cuts. All styles are furnished for either direct or alternating current. The blades of the desk and bracket fans are said to be constructed on such principles and angles as to give an even air pressure across the entire front, with no tendency to project a hollow cone of air. On the contrary, the breeze goes out as a solid cylinder of air without eddying currents, thus resulting in a high air delivery, although the total wall consumption is decreased. The motor is mounted on trunnions whose line of sup-

port passes through its center of gravity, giving a balance at any angle in which it is held by two thumb screws, one for vertical and one for horizontal adjustment. By means of a simple adapter the desk and bracket types are made

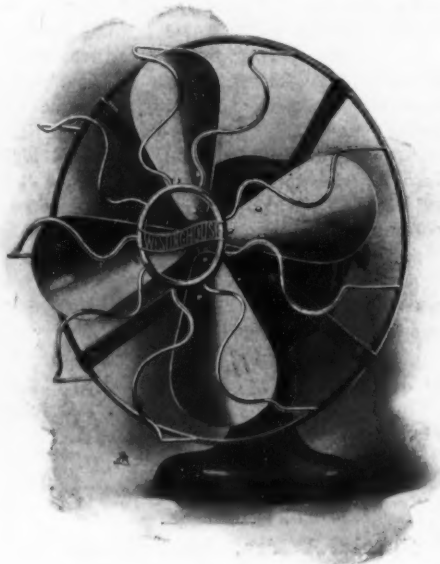


Fig. 1.—Direct Current Desk Fan.

interchangeable, giving the user the advantage of both styles of mounting. The ceiling and floor types are all finished in mottled copper as standard and have many distinct features of great value. The fan has three speeds

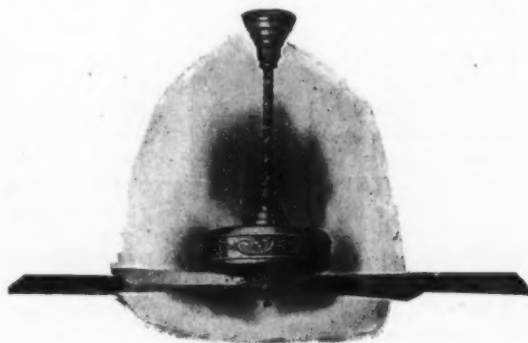


Fig. 2.—Alternating Current Ceiling Fan.

and four blades, which are set at angles calculated to give the highest possible movement of air with the least possible consumption of energy. The blades are securely attached to the moving element by screws, which ef-

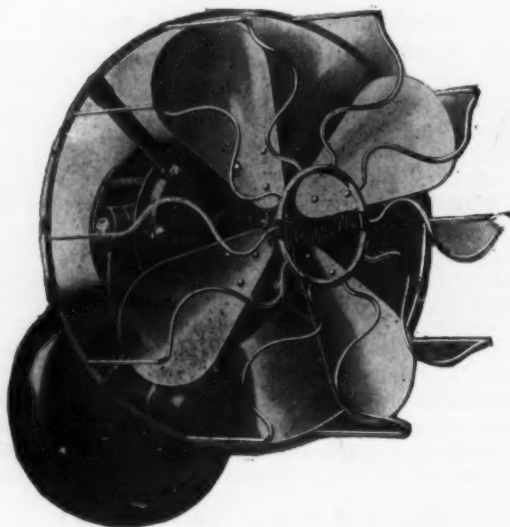


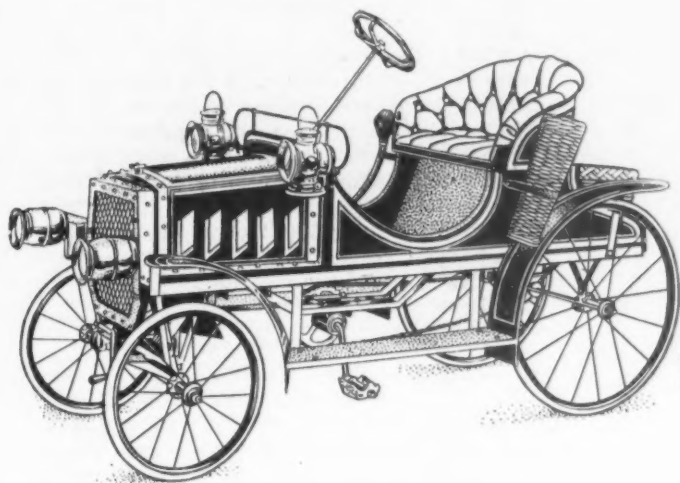
Fig. 3.—Alternating Current Bracket Fan.

fectually prevent them from turning from their normal position. Direct current desk fans are furnished for 115 or 230 volts in 12 or 16 inch sizes, with three speeds. Alternating current desk fans come in the same sizes and

for the same voltages, with two speeds and 7200 or 16,000 alternations, as specified. Where the bracket type is desired adapters are added at a nominal price. The direct and alternating current ceiling fans are furnished for 115 or 230 volts, have four blades of a sweep of 57 inches and are finished in black enamel and mottled copper.

Juvenile Automobile, Model A No. 120.

The Kirk-Latty Mfg. Company, Cleveland, Ohio, is manufacturing an extensive line of juvenile automobiles,



Juvenile Automobile, Model A No. 120.

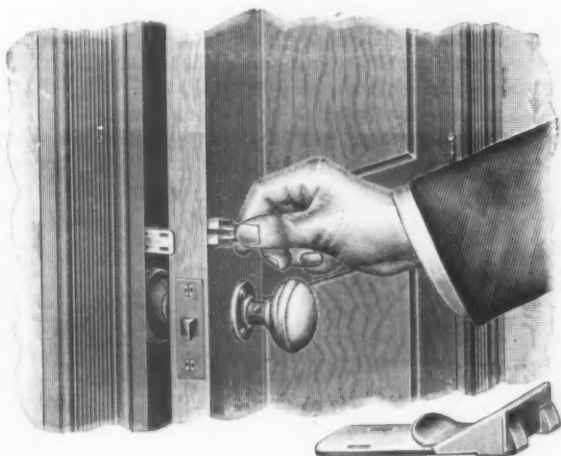
the accompanying cut showing one model. They are built on all steel chassis, or running gears. One of the main features of the machine is the company's rack and pinion

steering gear, on which a patent has been applied for and which is referred to as being positive and mechanical and as giving the child greater control of the machine. Another feature of the machines is that in constructing the line care was taken to obtain proper measurements and build the machines to suit the children; also making them as light as possible, compatible with the necessary strength to make them durable. The best material is used throughout in manufacturing the goods and care is taken in finishing them. The specifications of the machine illustrated are as follows: The body of the machine is 15 x 48 inches in size, with rubber tired wheels, 12 inches front and 18 inches rear; chain and sprocket drive, regular bicycle construction; best quality of rat trap pedals; full ball bearings throughout; frame and wheels finished in black enamel; steering wheel of brass; cranks, driving sprockets and pedals all heavily nickel plated and polished; the axle nuts are artillery style and the machine is provided with a ratchet starting crank and license tag. The body is finished red, black and yellow striping; hood trimmed with brass; brass rail around dash; adjustable seat, upholstered in black leather cloth; perforated metal radiator, and front and rear fenders connected with running board. The machine has two bullet lamps; horn with long tube; also golf basket and hamper. The oil burning side lamps are extra.

The Taylor Burglar Proof Door Securer.

The Taylor Mfg. Company, Hartford, Conn., is offering the burglar proof door securer shown herewith. The device, which is shown separately at the bottom of the illustration, is sent out in the shape shown, put together to carry in the pocket. The small triangular sliding piece protects the pocket from the two sharp prongs. Before using it is necessary to pull up on the curved end of the sliding piece until the lugs are out of the slots, when it will

easily slide off. The door is then opened and the prongs are pressed into the door jamb or casing, so that the prongs are about $\frac{3}{4}$ inch from the inside edge. The door



The Taylor Burglar Proof Door Securer.

is then closed and the triangular piece is slipped onto the other piece, with the triangular side toward the door, until it snaps into place, effectually locking the door.

Adamantine Screw Plates.

American Tap & Die Company, Greenfield, Mass., New York store 73 Warren street, is offering the stock and guides shown in the accompanying cuts. The stock takes the ordinary round split die, commonly called the Reece pattern. The advantage of the stock is that the dies and guides when dropped into the socket immediately align



Fig. 1.—Adamantine Screw Plate.

themselves so that the clearance holes of the guide match those in the die, and without any time being taken for adjustment. The stock may be immediately locked by a turn of the capstan screw at the side. The stocks are made with knurled handles, the centers being of

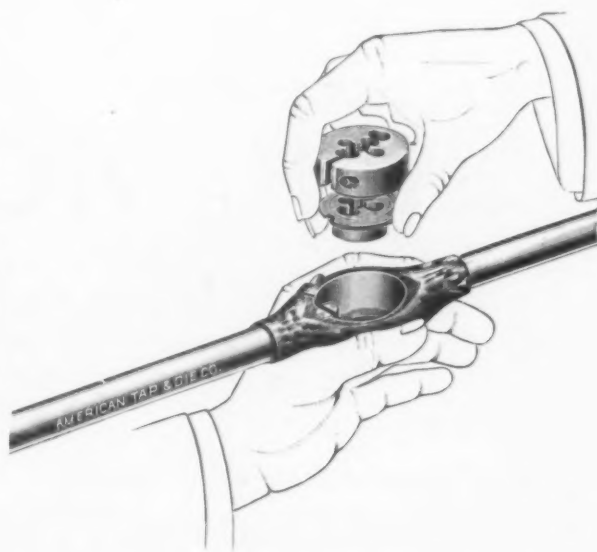


Fig. 2.—Manner in Which Die and Guide Are Dropped Into the Socket.

oxidized mottled finish. The dies are adjustable and are made from solid steel, in one piece. Tap wrenches are furnished free with sets and are put up with assortments containing dies 13-16-inch, 1-inch, 1½-inch and 2¼-inch diameter.

Currie's Patent Saw Cabinet and Display Case.

Currie Hardware Company, Mason City, Iowa, is putting on the market the saw cabinet and display case shown herewith. The cabinet and case is made up of three sections. The upper portion may be used as a display counter cabinet, with or without the drawer base, or these two sections may be combined with the floor base, as here illustrated. The sections are referred to as being made by experienced fixture makers in a most thorough and workmanlike manner. Only thoroughly



Fig. 1.—Currie's Patent Saw Cabinet and Display Case.

kiln dried lumber is used in the construction. The outside is of oak and the interior of well seasoned and clear soft wood. The back of the case is paneled oak, finely finished, so that it may be used as a center display case. The hardware is first quality as to strength, finish and utility, and the varnish is selected with special care and applied by experienced workmen. As will be seen from Fig. 2 the bins are wedge shaped and the stock is put in and removed from both ends of the case. The point is made that as a saw handle is thicker than its point the wedge shaped bins permits placing two saws in the space

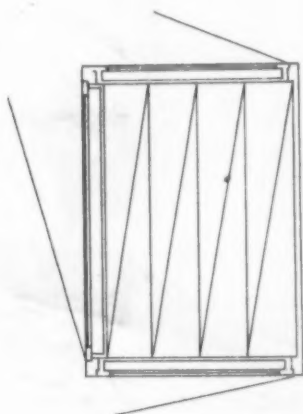


Fig. 2.—Arrangement of Saw Bins in Display Case.

that one usually occupies. There are 40 bins in the case, 20 at each end, and each bin will hold four 28-inch rip saws, so that opening either end door exposes the contents of 20 bins. It is pointed out that as the cabinet provides a place for every saw pattern, length and point, a salesman can put his hand on any saw wanted. Another advantage claimed is that an order can be called off to a traveling salesman faster than he can write it, and as the merchant knows the selling numbers the stock can be kept at a minimum, with plenty of backing on the best

sellers. The two end doors and the front door are used for display purposes, there being a space of 1 7/8 inches between the glass and back in the end doors and 2 1/2 inches space at the front door. The display doors at end make a prominent display of saws, while the front display space affords an excellent opportunity for displays, including chisels, bits, squares, scissors, paint brushes, and the hundred and one other articles that can be displayed to advantage. This portion of the fixture is 44 1/2 inches high, 40 1/2 inches long and 28 inches deep. The height of the drawer base is 9 inches, containing four drawers, two 18 x 27 inches in size, 3 inches deep, and two 4 inches deep. Files, auger bits and chisels, it is suggested, may be kept in the drawers, or they can be utilized for other purposes. The advantage of the base, when the case is set on a counter, is the clearance it gives for the end doors over packages which may be on the counter. The height of the case with the drawer base is 53 1/2 inches. The floor or cupboard base contains two shelves, entrance being afforded from the front by two swinging doors. The height of the base is 32 inches, the three sections combined being 85 1/2 inches. A cabinet of this kind has been in use in the retail hardware store with which the patentee is connected for two years, and has been found entirely satisfactory.

Metallic Wall Racks.

A line of metallic wall racks is being made by Ideal Register & Metallic Furniture Company, Detroit, Mich. The racks have sliding hangers which fit on the metal straps to which the coat and hat hooks are attached, so



Fig. 1.—Metallic Wall Rack, No. 74.

that it is a simple matter to adjust them so that the screws with which they are attached to the wall will strike the studding. This is particularly desirable where they must be attached to a lath and plaster wall. The three styles shown in the accompanying cuts are made as follows: No. 74 has a 3/4-inch cold rolled steel strap, 20 inches long, and four malleable iron hooks; No. 76, same

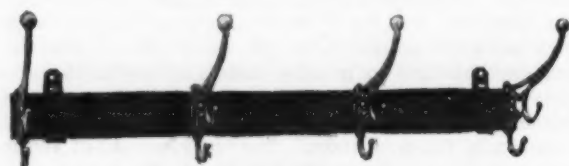


Fig. 2.—Metallic Wall Rack, No. 84.

as No. 74, but has six hooks on a 30-inch strap; No. 84, 2-inch cold rolled steel strap 24 inches long, has four malleable iron hooks; No. 86, same as No. 84, but has 36-inch strap with six hooks; No. 94, 2-inch cold rolled steel strap 24 inches long, with four malleable iron hooks connected by two 3-16-inch Bessemer steel rods; No. 96,

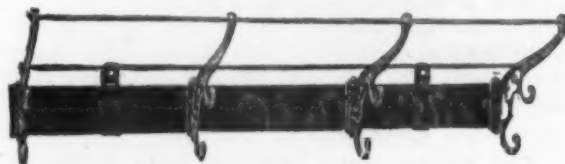


Fig. 3.—Metallic Wall Rack, No. 94.

same as No. 94, but has 36-inch strap with six hooks. All styles are burnished in oxidized copper or nickel finish. The racks may be used to supplement the ordinary ball rack, as well as in toilet rooms and closets. The racks are referred to as reasonable in price and easy to put in position.

Current Hardware Prices.

General Goods.—In the following quotations General Goods—that is, those which are made by more than one manufacturer—are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

Special Goods.—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

Range of Prices.—A range of prices is indicated by means of the symbol @. Thus 33 $\frac{1}{2}$ %, @ 33 $\frac{1}{2}$ %, & 10% signifies

that the price of the goods in question ranges from 33 $\frac{1}{2}$ %, per cent. discount to 33 $\frac{1}{2}$ %, and 10 per cent. discount.

Names of Manufacturers.—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE DIRECTORY, issued May, 1905, which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—A new edition of "Standard Hardware Lists" has been issued and contains the list prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Adjusters, Blind—

Domestic, # doz. \$3.00.....33 $\frac{1}{2}$ %
North's.....10%
Zimmerman's.....10%

Window Stop—

Ives' Patent.....35%
Taplin's Perfection.....35%

Ammunition—See Caps, Cartridges, Shells, &c.

Anvils—American—

Eagle Anvils.....# lb 6% @ 7%
Hay-Budden, Wrought.....90%
Horseshoe brand, Wrought.....90%
Trenton.....# lb 5% @ 6%

Imported—

Peter Wright & Sons.....# lb 10%
Anvil, Vise and Drill—

Millers Falls Co., \$18.00.....15% @ 10%

Apple Parers—See Parers, Apple, &c.

Aprons, Blacksmiths'—

Livingston Nail Co.....33 $\frac{1}{2}$ %

Augers and Bits—

Com. Double Spur.....75 @ 75 @ 5%

Jennings' Patn., reg. finish.....50 @ 10 @ 60%

Black Lip or Blued.....60 @ 10%

Boring Mach. Augers.....70 @ 10%

Car Bits, 12-in. twist.....50 @ 10%

Forstner Auger and Car Bits.....40 @ 5%

Forstner Pat. Auger Bits.....25%

C. E. Jennings & Co.:
No. 10 ext. lip, R. Jennings' list.....25%

No. 30, R. Jennings' list.....40 @ 4%

Russell Jennings.....25 @ 10 @ 2%

L'Hommedieu's Car Bits.....15%

Mayhew's Countersink Bits.....45%

Millers Falls.....50 @ 10 @ 7%

Ohio Tool Co.'s Bailey Auger and Car Bits.....40 @ 10%

Pugh's Black.....20%

Pugh's Jennings' Pattern.....30%

Snell's Auger Bits.....60%

Snell's Bell Hangers' Bits.....60%

Snell's Car Bits, 12-in. twist.....60 @ 10%

Wright's Jennings' Bits.....%

Bit Stock Drills—

See Drills, Twist.

Expansive Bits—

Clark's small, \$15, large, \$30.....50 @ 10%

Clark's Pattern, No. 1, # doz. \$20.....65%

No. 2, # doz. \$18.....65%

Ford's, Clark's Pattern.....60 @ 5%

C. E. Jennings & Co., Steer's Pat.....25%

Swan's.....60%

Gimlet Bits—

Common Dble. Cut.....\$3.00 @ \$3.25

German Pattern, Nos. 1 to 10, \$1.60; 11 to 13, \$5.75

Hollow Augers—

Bonney Pat., per doz. \$5.50 @ 6.00

Ames.....25 @ 10%

Universal.....25%

Wood's Universal.....25%

Ship Augers and Bits—

Ship Augers.....\$4.50 @ 5%

Ford's.....33 $\frac{1}{2}$ @ 5%

C. E. Jennings & Co.:
L'Hommedieu's.....15%

Watrous.....35 @ 5%

Ohio Tool Co.'s.....40%

Snell's.....40%

Awl Hats—See Handles, Mechanics' Tool.

Awls—

Brad Awls:

Handled.....gro. \$2.75 @ \$3.00

Unhlded, Shldered.....gro. \$3 @ \$3.50

Unhanded, Patent.....gro. \$3 @ \$3.50

Peg Awls:

Unhanded, Patent.....gro. \$1 @ \$1.40

Unhlded, Shldered.....gro. \$1 @ \$1.40

Scratch Awls:

Handled, Com.....gro. \$3.50 @ \$4.00

Handled, Socket.....gro. \$11.50 @ \$12.00

Hurwood

.....40%

Awl and Tool Sets—See Sets, Awl and Tool.

Axes—

See Grease, Axe

Axles—

Iron or Steel

Concord, Loose Collar.....\$4 @ \$4.50

Concord, Solid Collar.....\$4 @ \$4.50

No. 1 Common, Loose.....\$4 @ \$4.50

No. 1 $\frac{1}{2}$ Com., New Styles.....\$4 @ \$4.50

No. 2 Solid Collar.....\$4 @ \$4.50

Half Patent:

Nos. 7, 8, 11 and 12.....75 @ 75 @ 5%

Nos. 13 to 14.....70 @ 10 @ 75 @ 5%

Nos. 15 to 18.....75 @ 10 @ 75 @ 10 @ 5%

Nos. 19 to 22.....75 @ 10 @ 75 @ 10 @ 5%

Boxes, Axle—

Common and Concord, not turned lb. 4 $\frac{1}{2}$ @ 5 $\frac{1}{2}$

Common and Concord, turned lb. 5 $\frac{1}{2}$ @ 6 $\frac{1}{2}$

Half Patent.....lb. 8 $\frac{1}{2}$ @ 9 $\frac{1}{2}$

Bait—

Hendryx:

A Bait.....20%

B Bait.....25%

Competitor Bait.....20 @ 5%

Balances—

Caldwell new list.....50%

Pullman.....50 @ 10 @ 60%

Spring—

Spring Balances.....50 @ 10 @ 60%

Chatillon's:

Light Spg. Balances.....40 @ 10%

Straight Balances.....40%

Circular Balances.....40%

Large Dial.....30%

Barb Wire—See Wire, Barb.

Bars—

Steel Crowbars, 10 to 40 lb. per lb. 3 $\frac{1}{2}$ @ 4 $\frac{1}{2}$

Towel—

No. 10 Ideal, Nickel Plate.....# gro. \$5.50

Beams, Scale—

Scale Beams.....40 @ 10 @ 50%

Chatillon's No. 1.....30%

Chatillon's No. 2.....40%

Beaters, Carpet—

Holt-Lyon Co.:
No. 12 Wire Coppered # doz. \$0.85;

Tinned.....\$1.00

No. 11 Wire Coppered # doz. \$1.10;

Tinned.....\$1.20

No. 10 Wire Galvanized # doz. \$1.75

Western W. G. Co.:
No. 1 Electric.....# gro. \$7.80

No. 2 Buffalo.....# gro. \$9.00

No. 3 Perfection Dust.....# gro. \$6.00

Egg—

Holt-Lyon Co.:
Holt, No. A, Japanned.....# doz. \$1.20

Holt, No. 1, Tinned.....# doz. \$1.50

Holt, No. B, Japanned.....# doz. \$2.00

Holt, No. 2, Tinned.....# doz. \$2.25

Lyon, No. 2, Japanned.....# doz. \$1.25

Lyon, No. 3, Japanned.....# doz. \$1.50

Taplin Mfg. Co.:
No. 60 Improved Dorer.....# doz. \$6.00

No. 75 Improved Dorer.....# doz. \$6.50

No. 100 Improved Dorer.....# doz. \$7.00

No. 102 Improved Dorer, Tin'd.....# doz. \$8.50

No. 150 Improved Dorer, Hotel.....\$15.00

No. 152 Imp'd Dorer, Hotel, T'd.....\$18.50

No. 200 Imp'd Dorer Tumbler, T'd.....\$9.50

No. 202 Imp'd Dorer Tumbler, T'd.....\$9.50

No. 300 Imp'd Dorer Mammoth, # doz.....\$25.00

T. & S. Dorer.....\$6.00

Western, W. G. Co., Buffalo.....\$7.00

Wonder (R. M. Co.).....# gro. net. \$6.00

Bellows—

Blacksmith, Standard List.....60 @ 10 @ 70 @ 10%

Hand—

Inch.....6 7 8 9 10

Doz.....\$4.75 5.70 6.65 7.60 8.85

Molders—

Inch.....9 10 11 12 14

Doz.....\$8.00 9.00 10.50 12.50 14.50

Bells—

Ordinary goods.....75 @ 5 @ 75 @ 10 @ 5%

High grade.....70 @ 10 @ 70 @ 10 @ 5%

Jersey.....75 @ 10%

Texas Star.....50%

Door—

Abbe's Gong.....45%

Burton Gong.....50%

Home, R. & E. Mfg. Co.'s.....55 @ 10%

Lever and Pull, Sargent's.....60 @ 10 @ 10%

Trip Gong.....50 @ 10 @ 50 @ 10 @ 5%

Yankee Gong.....55%

Hand—

Hand Bells, Polished, Brass.....60 @ 10%

White Metal.....60%

Nickel Plated.....50 @ 10 @ 60%

Sticks.....60 @ 60 @ 75 @ 5%

Cone's Globe Hand Bells.....33 $\frac{1}{2}$ @ 35%

Silver Chime.....33 $\frac{1}{2}$ @ 35%

Miscellaneous

Farm Bells.....lb. 2 $\frac{1}{2}$ @ 3 $\frac{1}{2}$

Steel Alloy Church and School.....50 @ 60 @ 60%

American Tube & Stamping Co. Gong.....75%

Table Call Bells.....60 @ 50 @ 10%

Belting—Leather—

Extra Heavy, Short Lap.....60 @ 5%

Regular Short Lap.....60 @ 10 @ 5%

Standard.....70%

Light Standard.....70 @ 5%

Cut Leather Lacing.....50%

Leather Lacing Sides, per sq. ft. 25¢

Rubber—

Agricultural (Low Grade).....75 @ 75 @ 5%

Common Standard.....70 @ 70 @ 10%

Standard.....60 @ 60 @ 10%

Extra.....60 @ 60 @ 5%

High Grade.....50 @ 50 @ 10%

Bench Stops—

See Stops, Bench

Benders and Upsetters, Tire—

Detroit Perfected Tire Bender.....40%

Detroit Standard's Lightning Tire Upsetters, No. 1, \$4.25; No. 2, \$7.25;

No. 3, \$10.50; No. 4, \$16.25; No. 5, \$20.50.

Green River Tire Benders and Upsetters.....20%

Bicycle Goods—

John S. Leung's Son's 1902 list:

Chain.....50%

Parts.....50%

Spokes.....50%

Tubes.....60%

Bits—

Auger, Gimlet, Bit Stock Drills, &c.—See Augers and Bits.

Blocks—Tackle—

Common Wooden.....70 @ 10 @ 75%

Hartz St. Tackle Blocks.....50 @ 50 @ 5%

B. & L. B. Co.:
Junior Wood Snatch, 50%; Eclipse

Steel, 75%; Hollow Steel, 50 @ 10%;

Star Wire Rope, 50%; Tarbox Metal

Snatch, 50%; Tarbox New Style

Steel, 50 @ 10%; Wire Rope Snatch,

50%;

Lane's Patent Automatic Lock and

Junior.....30%

Stowell's Novelty, Mal. Iron, 50 @ 10%

Stowell's Self Loading.....60%

See also Machines, Hoisting.

Boards, Stove—

Zinc, Crystal, &c.....40%

Paper Embossed.....40 @ 10%

Boards, Wash—

See Washboards.

Bobs, Plumb—

Keuffel & Esser Co.....38 $\frac{1}{2}$ @ 5%

Boils—

Carriage, Machine, &c.—

Common Carriage (cut thread);

% 6 and smaller.....75 @ 5%

Gautier, Blom.....464%
Gautier, Sharp.....464%
Perkins' Toe.....\$ 10 3.50
Perkins' Sharp Toe.....\$ 10 4.15

Can Openers—

See Openers, Can.

Cans, Milk—

Illinois Pattern.....1.35 1.85 2.35 each.
New York Pattern.....1.50 2.25 2.45 each.
Baltimore Pattern.....1.50 2.25 2.45 each.
Dubuque.....1.35 1.60 1.75 each.

Cans, Oil—

Buffalo Family Oil Cans:
\$18.00 60.00 120.00 gro. net.

Caps, Percussion—

Eley's E. B.....52@55¢
G. D.....per M 34@35¢
F. L.....per M 40@42¢
G. E.....per M 48@50¢
Musket.....per M 62@63¢

Primers—

Berdan Primers, \$2 per M.....30%
B. L. Caps (Sturtevant Shells)
\$2 per M.....20%
All other primers per M \$1.52@1.60

Cartridges—

Blank Cartridges:
32 C. F., \$5.50.....10.65%
33 C. F., \$7.00.....10.65%
22 cal. Rim, \$1.50.....10.65%
32 cal. Rim, \$2.75.....10.65%
B. B. Caps, Con. Ball, Sgw'd, \$1.90
B. B. Caps, Round Ball.....\$1.49
Central Fire.....25%
Target and Sporting Rifle.....15.65%
Primed Shells and Bullets.....15.10%
Rim Fire, Sporting.....50%
Rim Fire, Military.....15.65%

Casters—

Bed.....70@70.40%
Plate.....60@10@60.40%
Philadelphia.....75@75.10%
Acme, Ball Bearing.....33%
Boss.....70@10%
Boss Anti-Friction.....70@10%
Gem (Roller Bearing).....60%
Martin's Patent (Phoenix).....45%
Standard Ball Bearing.....45%
Tucker's Patent low list.....30%
Yale (Double Wheel) low list.....50%

Cattle Leaders—

See Leaders, Cattle.

Chain, Coil—

American Coil, Straight Link:
5-16 1/4 5-16 3/4 7-16 1/2 9-16
\$3.70 5.90 4.95 4.20 4.05 3.95 3.90
3/8 3/4 7/8 1 1 1/4 1 1/2 1 3/4 inch.
\$3.85 3.70 3.65 3.80
German Coil.....60@10@10.70%

Halter—

Halter Chain.....60@5@60.10%
German Pattern, Halter Chain,
list July 23, '97.....60@10@10%

Covert Mfg. Co.

Halter.....35@57%
Covert's Saddlery Works

Cow Ties—

See Halters and Ties.

Trace, Wagon, &c.—

Traces, Western Standard: 100 pr.
6 1/2-6-3, Str'ght, with ring, \$25.00
6 1/2-6-2, Str'ght, with ring, \$26.00
6 1/2-8-2, Str'ght, with ring, \$30.00
6 1/2-10-2, Str'ght, with ring, \$35.00
NOTE—Add 2c per pair for Hooks.
Twist Traces 2c per pair higher than
Straight Link.

Eastern Standard Traces, Wag-
on Chain, &c.....60@10%

Miscellaneous—

Jack Chain, list July 10, '93:
Iron.....60@10@60.40%
Brass.....60@10@60.10%

Safety Chain.....75@75.10%
Gal. Pump Chain.....10.4@14%

Covert Mfg. Co.:
Breast, Halter, Heel, Rein, Stal-
lion.....40%
Covert Sad. Works:
Breast, Hold Back, Rein.....70%
Oneida Community:
Am. Dog Leads and Kennel Chains,
40@40.5%
Niagara Dog Leads and Kennel
Chains.....45@60.5%
Wire Goods Co.:
Dog Chain.....70@10%
Universal Dbl.-Jointed Chain.....50%

Chain and Ribbon, Sash—
Oneida Community:
Copper Chain.....60@5%
Steel Chain.....60%

Pullman:
Bronze Chain.....60%
Steel Chain.....60@10%
Sash Chain Attachments, per set, 8¢
Aluminum Sash Ribbon, per 100
ft.....\$1.25@3.00
Sash Ribbon Attachments, per set, 8¢

Chalk—(From Jobbers.)
Carpenters' Blue.....gro. 38@10¢
Carpenters' Red.....gro. 33@35¢
Carpenters' White.....gro. 28@30¢
See also Crayons.

Checks, Door—

Bardsley's.....45%
Eclipse.....60@10%
Pullman, per gro.....\$4.00
Russwin.....60%

Chests, Tool—

American Tool Chest Co.:
Boy's Chests, with Tools.....25%
Youths' Chests, with Tools.....40%
Gentlemen's Chests, with Tools, 30%
Farmers' Carpenters' etc., Chests,
with Tools.....20%
Machinists' and Pipe Fitters'
Chests, Empty.....50%
Tool Cabinets.....50%
C. E. Jennings & Co.'s Machinists'
Tool Chests.....35@10%

Chisels—

Socket Framing and Firmer
Standard List.....75@10@75.10¢5%

Buck Bros.....30%
Charles Buck.....30%
C. E. Jennings & Co. Socket Firmer
No. 10.....60%
C. E. Jennings & Co. Socket Fram-
ing No. 15.....60%
Ohio Tool Co.'s.....70%
Swan's.....75%
L. & I. J. White, Tanged.....30@65%
L. & I. J. White, Tanged.....25@5%

Tanged—

Tanged Firmers.....33 1/3-40%

Buck Bros.....30%
Charles Buck.....30%
C. E. Jennings & Co. Nos. 191, 181, 25%
Cold Chisels, good quality, 13@15¢
Cold Chisels, fair quality, 11@12¢
Cold Chisels, ordinary.....9@10¢

Chucks—

Almond Drill Chucks.....35%
Almond Turret Six-Tool Chuck.....35%
Beach Pat., each \$8.00.....35@3%
Empire.....25%
Blacksmiths'.....25%
Jacobs' Drill Chucks.....35%
Pratt's Positive Drive.....25%
Skinner Patent Chucks:
Independent Lathe Chucks.....40@10%
Universal, Reversible Jaws.....40%
Combination, Reversible Jaws.....40%
Drill Chucks, New Model.....25%
Drill Chucks, Standard.....40@10%
Drill Chuck, Skinner Pat.....25%
Drill Chucks, Positive Drive.....33%
Planer Chucks.....30%
Face Plate Jaws.....40@10%
Standard Tool Co.:
Improved Drill Chuck.....45%
Union Mfg. Co.:
Combination, Nos. 1, 2, 3, 4, 5, 6,
7, 8 and 17.....40%
Combination, No. 21.....35%
Scroll Combination, Nos. 82 and
84.....30%
Independent Iron, Nos. 18 and 318, 40%
Independent Steel, No. 64.....30%
Iron Czar Drill, Nos. 000, 101,
103.....35%
Universal 11, 12, 16, 17, 13, 14, 15, 40%
Universal, No. 42.....30%
Iron Face Plate Jaws, Nos. 28, 30,
48 and 50.....40%
Steel Face Plate Jaws, Nos. 70 and
72.....35%
Westcott Patent Chucks:
Little Giant Auxiliary Drill.....50%
Little Giant Double Grip Drill.....50%
Little Giant Drill, Improved.....50%
Oneida Drill.....50%
Scroll Combination Lathe.....50%

Clamps—

Adjustable, Hammers'.....20@20.5%
Cabinet, Sargent's.....50@10%
Carriage Makers', P. S. & W.
Co.....40@10@50%
Carriage Makers', Sargent's.....40%
Besly Parallel.....35@40%
Lineman's, Utica Drop Forge & Tool
Co.....40%
Wood Workers, Hammers'.....40@10%
Saw Clamps, See Vices, Saw Filers'.

Cleaners, Drain—

Iwan's Champion, Adjustable.....55%
Iwan's Champion, Stationary.....40%

Sidewalk—

Star Socket, All Steel.....\$9 doz. \$4.05 net
Star Shank, All Steel.....\$9 doz. \$3.24 net
W. & C. Shank, All Steel, \$9 doz.,
7 1/4 in., \$3.00; 8 in., \$3.25

Cleavers, Butchers—

Foster Bros.....40%
New Haven Edge Tool Co.'s.....30%
Fayette R. Plumb.....30%
L. & I. J. White.....30%

Clippers, Horse and

Sheep—
Chicago Flexible Shaft Company:
'98 Chicago Horse, each.....\$3.75
1902 Chicago Horse, each.....\$10.75
20th Century Horse, each.....\$5.00
Lightning Belt Horse, each.....\$15.00
Chicago Belt Horse, each.....\$20.00
Stewart's Enclosed Gear
Horse, each.....\$1.75
Stewart's Patent Sheep Shear-
ing Machine, each.....\$12.75

Clips, Axle—

Regular Styles, list July 1, '05.80%

Cloth and Netting, Wire

—See Wire, &c.

Cocks, Brass—

Hardware list:
Compression, Plain Bibbs,
Globe, Kerosene, Racking,
&c., Cocks.....75@75.4%
Coffee Mills—
See Mills, Coffee.

Collars, Dog—

Nickel Chain, Walter B. Stevens &
Son's list.....40%
Leather, Walter B. Stevens & Son's
list.....40%

Combs, Curry—

Metal Stamping Co.....40%

Mane and Tail—

Covert's Saddlery Works.....60@10%

Compasses, Dividers, &c.

Ordinary Goods.....75@5@75.10%
Bemis & Call Hdw. & Tool Co.:
Dividers.....65%
Calipers, Double.....65%
Calipers, Inside or Outside.....65%
Calipers, Wing.....60%
Compasses.....60%
Wm. Schollhorn Co.:
Excelsior Dividers.....60%
Lodi Dividers.....75%

Conductor Pipe—

L. C. L. to Dealers:
Territory: Galvanized
Galv. Charcoal
Steel. Iron. Copper.

Eastern: 70@10 % 60@7 1/2 % 50 %
Central: 70@2 1/2 % 60 % 40@10@5 %
Western and S. W.: 65@10 % 50@10@2 1/2 % 47 1/2 %

No. Western 62 1/2 @ 67 1/2 % 50 @ 55 % 40 @ 10 %
Copper. 14 @ 16 oz.
Eastern.....50@10%
Central.....50@7 1/2 %
Southern.....50@5 %
So. Western.....50@2 1/2 %
Terms, 60 days; 2% cash 10 days. Fac-
tory shipments generally delivered.

See also Eave Troughs.**Coolers, Water—**

Gal. each.....2 3 4 6 8
Labrador.....\$1.20 \$1.50 \$1.80 \$2.10 \$2.70
Gal.....3 4 6 8
Iceland, ea. \$1.80 \$2.10 \$2.40 \$3.00
Galvanized, ea. \$1.35 \$2.00 \$2.25 \$2.90 \$3.90
Galvanized, Lined, side handles,
Gal.....2 3 4 6 8
Each.....\$1.95 \$2.15 \$2.40 \$3.30 \$4.15
White Enameled.....25%
Agate Lined.....25%

Coopers' Tools—

See Tools, Coopers'.

Coppers' Soldering—

Soldering Coppers, 3 lbs. to pair
and heavier, 23@24¢; lighter
than 3 lbs. to pair.....25@26¢

Cord—Sash—

Braided, Drab.....lb. 35¢
Braided, White, Com., Nos. 8
to 12, 24¢; No. 7, 24 1/2¢; No. 6,
25 1/2¢.

Cable Laid Italian—

lb., A, 18¢; B, 16¢
Common India.....lb. 10@10 1/2¢
Cotton Sash Cord, Twisted.....17@19¢
Patent Russia.....lb. 14¢
Cable Laid Russia.....lb. 14¢
India Hemp, Braided.....lb. 18¢
India Hemp, Twisted.....lb. 12@13¢
Patent India, Twisted.....lb. 12@13¢

Anniston Cordage Co.: 3/4 lb. solid
Braided, Nos. 8 to 12, \$0.24; No. 7,
\$0.21 1/2; No. 6, \$0.25 1/2; 3/4 doz. 50 ft.
Oriole \$2.00; 50 ft., Columbia, \$0.85;
50 ft., Victor, \$1.00; 50 ft., 6-Thread,
\$1.10; 60 ft., 3-Thread, \$0.95; 50 ft.,
Manila, \$1.40; 60 ft., Jute, \$0.75.

Pearl Braided, cotton, No. 6, 3/4 lb.,
25¢; No. 7, 25¢; Nos. 8 to 12, 24 1/2¢
Eddystone Braided, Nos. 8, 9 and
10, 25¢; 7, 25 1/2¢; 6, 25¢.

Harmony Cable Laid Italian, Nos. 7
to 10.....lb. 23¢
Peerless:
Cable Laid Italian.....16¢
Cable Laid Russian.....16¢
Cable Laid India.....12¢
Braided India.....18¢

Pullman:

Wire Sash Cord.....10%
Sash Cord Attachments, per doz. 10¢
Samson, Nos. 8 to 12.....lb. 40¢
Braided, Drab Cotton.....lb. 40¢
Braided, Italian Hemp.....lb. 40¢
Braided, Linen.....lb. 55¢
Braided, White Cotton or Spot.....lb. 35¢

Massachusetts, White.....lb. 30¢
Massachusetts, White.....lb. 30¢
Phoenix, White, Nos. 8 to 12, 27¢;
No. 7, 27 1/2¢; No. 6, 28 1/2¢.

Silver Lake:

A, Drab.....45¢
A, White.....40¢
B, Drab.....40¢
B, White.....35¢
Italian Hemp.....40¢
Linen.....57 1/2¢

See also Chain and Ribbon.**Wire, Picture—**

List Oct., '00.....85@10@10.65@10.65%
Hendryx Standard Wire Picture Cord,
85@10%

Cradles—

Grain.....40@12 1/2 %

Crayons—

White Round Crayons, gr. 6@6 1/2¢
Cases, 100 gro., \$5.00 at factory.

D. M. Stewart Mfg. Co.:
Genuine, Per gro.
Round Pencil, \$2.25; Square Pen-
cil, \$1.75; Flat Crayon, \$2.50;
Metal Workers' Crayon, \$3.00;
Rolling Mill Crayon, \$3.00.

Compo. Per gro.
Round Pencil, \$1.50; Square Pen-
cil, \$1.50; Flat Crayon, \$1.50;
Metal Workers' Crayon, \$2.50;
Rolling Mill Crayon, \$2.50;
Railroad Crayon, \$4.00; Compo.
Crayon, \$4.00.

Zelnicke's Lumber:
Red, Blue, Green.....\$9 gro. \$6.50
Black.....\$9 gro. \$4.00
See also Chalk.

Crooks, Shepherds—

Fort Madison, Heavy.....\$ doz. \$7.00
Fort Madison, Light.....\$ doz. \$6.50

Crow Bars—See Bars, Crow.**Cultivators—**

Victor Garden.....50%

Cutlery, Table—

International Silver Company:
No. 12 M'd'm Knives, 1847, \$ doz. \$3.50
Star, Egle, Rogers & Hamilton
and Anchor.....\$ doz. \$3.00
Wm. Rogers & Son.....\$ doz. \$2.50

Cutters—Glass—

H. H. Mayhew Co.....40%
Red Devil.....50%
Smith & Hemenway Co.....50%
Woodward.....40%

Meat and Food—

American.....30%
Nos.....1 2 3 4 B 5
Each.....\$5 \$7 \$10 \$25 \$50 \$60
Enterprise:
Each.....\$2 \$3 \$2.75 \$4.50 \$6.25@25¢7 1/2 %
No. 202, \$1.50.....40@7 1/2 %
Dixon's.....\$ doz. 40@50%

Cutters—Glass—

Each.....\$1 \$2 \$3 \$4
Nos.....1 2 3 4
\$14.00 \$17.00 \$19.00 \$34.00

Ideal.....40@10@50%
Little Giant.....\$ doz. 40@50%
Nos.....305 310 312 320 322
\$33.00 \$18.00 \$14.00 \$72.00 \$68.00
N. E. Food Choppers.....40@50%
New Triumph No. 605, \$ doz. \$24.00,
100 150

Russwin Food, No. 1, \$24.00; No. 2,
\$27.00.....45@10@10%
Woodruff's.....\$ doz. 40@50%
Nos.....100 150

Enterprise Beef Shavers.....25@30%

Slaw and Kraut—

Henry Diaston & Sons:
Slaw, Corn Grater, &c.....40%
Kraut Cutters, 24 x 7, 26 x 8, 30
x 9.....55%
Kraut Cutters, 36 x 12, 40 x 12.....40%
J. M. Mast Mfg. Co.:
Slaw Cutters, 1 Knife.....\$ doz. \$3.00
Combined Slaw Cutter and Corn
Grater.....\$ doz. \$4.00

Tucker & Dorsey Mfg. Co.:
Kraut Cutters, 1 Knife.....\$ doz. \$3.00
Slaw Cutters, 2 Knife.....\$ gr. \$22@24¢

Tobacco—

All Iron, Cheap.....\$ doz. \$4.25@4.50
Enterprise.....25@30%
National, \$ doz. No. 1, \$21; No. 2,
\$18.....40%
Sargent's, \$ doz. No. 2.....40%
Sargent's, Nos. 12 and 21.....60@10%

Washer—

Appleton's, \$ doz., \$16.00.....50@10@10%

Diggers, Post Hole, &c.—

Dalbey Post Hole Auger, per doz. \$9.00
Iwan's Imp'vd Post Hole Auger, 40@5%
Iwan's Vaughan Pattern Post Hole
Augers.....\$ doz. \$6.25
Iwan's Perfection Post Hole Digger.....\$ doz. \$8.25
Iwan's Split Handle Post Hole Dig-
gers.....\$ doz. \$7.25
Kohler's Universal.....\$ doz. \$14.00
Kohler's Little Giant.....\$ doz. \$12.00
Kohler's Hercules.....\$ doz. \$10.00
Kohler's Invincible.....\$ doz. \$9.00
Kohler's Rival.....\$ doz. \$8.00
Kohler's Pioneer.....\$ doz. \$7.00
Never-Break Post Hole Diggers, \$
doz., \$24.00.....60%
Samson, \$ doz. \$34.00.....25%

Dividers—See Compasses.**Drawers, Money—**

Tucker's Pat. Alarm Till No. 1, \$
doz., \$18; No. 2, \$15; No. 3, \$12;
No. 4, \$18.

Drawing Knives—

See Knives, Drawing.

Dressers, Emery Wheel—

Diamond Emery Wheel Dressers.....35%
Diamond Wheel Dresser Cutters.....35%

Drills and Drill Stocks—

Common Blacksmiths' Drill,
each.....\$1.50@1.75
Breast, Millers Falls.....15@10%
Breast, P. S. & W.....40%
Goodell Automatic Drills.....40@50%
Johnson's Automatic Drills, Nos. 2,
3 and 3.....16%
Johnson's Drill Points.....16%
Millers Falls Automatic Drills.....33@10%
Ratchet, Curtis & Curtis.....25%
Ratchet, Parker's.....40%
Ratchet, Weston's, Style H.....40%
Ratchet, Weston's, Style H, Im-
proved.....40%
Ratchet, No. 012.....40%
Ratchet, Whitney's, P. S. & W. 50%
Whitney's Hand Drill, No. 1, \$10.00;
Adjustable, No. 10, \$12.00.....33 1/2 %

Twist Drills—

Bit Stock.....60@10@10.70%
Taper and Straight Shank.....60@10@60.10@5%

Drivers, Screw—

Screw Driver Bits, per doz. \$5@50¢
Balsey's Screw Holder and Driver, \$
doz., 2 1/2-in., \$6; 4-in., \$7.50; 6-in.,
\$9.....50%
Buck Bros' Screw Driver Bits.....30%
Champion.....50%
Edson.....50%
Fray's Hol. H'dle Sets, No. 3, \$12.50
Gay's Double Action Ratchet.....35%
Goodell's Auto.....50@10@10.50@10.65%
Hurwood.....40%
Mayhew's Black Handle.....40%
Mayhew's Monarch.....40@10%
Millers Falls, Nos. 20 and 21, 25@10%
Millers Falls, Nos. 11, 12, 41, 42, 15@10%
New England Specialty Co.....50@10%

Sargent & Co's:
Nos. 1 and 60.....50@10@10%
Nos. 50, 53 and 55.....60@10%
Nos. 20 and 40.....70@10%
Smith & Hemenway Co.....40@5%
H. D. Smith & Co.'s Perfect H'dle.....40%
Stanley R. & L. Co.'s:
No. 64, Varn. Handles.....65%
No. 86.....75%
Victor.....55%
Defiance.....70%
Swan's:
Nos. 7565 to 7568.....80%
No. 7540.....10@10%

Eave Trough, Galvanized—

Territory L. C. L. Galvanized
Galv. Charcoal
Steel. Iron. Copper.

No. 24.....	25%
No. 22.....	10%
Copper.....	80%
Elbows, Stove Pipe—	
Dover, one piece.....	40%
Perfect Elbows (R. M. Co.).....	40%
Emery, Turkish—	
4 to 46 5/4 to 220 Flour.	
Keys.....	1b. 5¢ 5 1/2¢ 3 1/2¢
1/4 Keys.....	1b. 5 1/4¢ 5 1/2¢ 5 1/4¢
1/2 Keys.....	1b. 5 1/2¢ 6¢ 4¢
10-lb. cans.....	
10 in case.....	6 1/2¢ 7¢ 6¢
10-lb. cans, less	
than 10.....	10¢ 10¢ 8¢
Less quantity.....	10¢ 10¢ 8¢
NOTE.—In lots 1 to 3 tons a discount	
of 10% is given.	

Extractors, Lemon Juice

—See Squeezers, Lemon.

Fasteners, Blind—

Zimmerman's.....50¢10%

Walling's.....40¢10%

Cord and Weight—

Faucets—

Cork Lined.....50¢10%

Metallic Key, Leather Lined.....

Red Cedar.....60¢10%

Petroleum.....70¢10%

B. & L. B. Co.:.....

Metal Key.....60¢10%

Star.....50¢10%

West Lock.....50¢10%

John Sommer's Peerless Tin Key.....

John Sommer's Boss Tin Key.....

John Sommer's Victor Mtl. Key.....

John Sommer's Duplex Metal Key.....

John Sommer's Diamond Lock.....

John Sommer's I. X. L. Cork Lined.....

John Sommer's Reliable Cork Lined.....

John Sommer's Chicago Cork Lined.....

John Sommer's O. K. Cork Lined.....

John Sommer's No Brand, Cedar.....

John Sommer's Perfection, Cedar.....

McKenna, Brass.....

Burglar Proof, N. P.....

Improved, 1/4 and 1/2 inch.....

Self Measuring.....

Enterprise, 1/2 doz. \$36.00.....

Lane's, 1/2 doz. \$36.00.....

National Measuring, 1/2 doz. \$36.00.....

Fello Plates—

See Plates, Felloe.

Files—Domestic—

List revised Nov. 1, 1899.

Best Brands.....70¢10%

Standard Brands.....70¢10%

Lower Grade.....70¢10%

Imported—

Stubs' Tapers, Stubs' List, July

24, '97.....33¢1-3¢40%

Fixtures, Fire Door—

Richards Mfg. Co. 103.....\$3.75

Universal, No. 104.....\$3.75

Explosion Links, No. 95.....50%

Expansion Bolts, No. 107.....50%

Grindstone—

Net Prices:

1/2 inch.....\$5 17 19 21

Per doz.....\$3.25 3.75 4.25 4.75

P. S. & W. Co.....30¢10%

Reading Hardware Co.....70%

Stowell's Giant Grindstone Hanger.....

Stowell's Grindstone Fixtures, Extra

Heavy.....50¢10%

Stowell's Grindstone Fixtures, Light

.....60¢10%

Fodder Squeezers—

See Compressors.

Forks—

NOTE.—Manufacturers are

selling from the list of September

1, 1904, but many jobbers are still

using list of August 1, 1899, or

selling at net prices.

Iowa Dig-Ezy Potato.....60¢10%

Victor, Hay.....60¢15¢2¢

Victor, Manure.....60¢

Victor, Header.....60¢

Champion, Hay.....60¢

Champion, Header.....60¢

Champion, Manure.....60¢15¢2¢

Columbia, Hay.....60¢2¢

Columbia, Manure.....70¢

Columbia, Spading.....70¢12¢

Hawkeye Wood Barley.....60¢20%

W. & C. Potato Digger.....60¢10%

Acme Hay.....60¢20%

Acme Manure, 4 line.....60¢10¢5¢

Dakota Header.....60¢20%

Jackson Steel Barley.....60¢20%

Kansas Header.....60¢

W. & C. Favorite Wood Barley.....40%

Plated.—See Spoons.

Frames—Saw—

White, S'g't Bar, per doz. 75¢80¢

Red, S'g't Bar, per doz. \$1.00\$1.25

Red, Dbl. Brace, per doz. \$1.40\$1.50

Freezers, Ice Cream—

Qt. 1 2 3 4 5 6

Each.....\$1.30 \$1.60 \$1.90 \$2.20 \$2.50

Fruit and Jelly Presses—

See Presses, Fruit and Jelly.

Fry Pans—See Pans, Fry.

Fuse—Per 1000 Feet.

Hemp.....\$2.75

Cotton.....3.20

Waterproof Sgl. Taped.....3.60

Waterproof Dbl. Taped.....4.40

Waterproof Tpl. Taped.....5.15

Gates, Molasses and Oil—

Stebbins' Pattern.....80¢10%

Gauges—

Marking, Mortise, &c. 50¢10¢60%

Chapin-Stephens Co.:.....

Marking, Mortise, &c. 50¢10¢60%

Scholl's Patent.....50¢10¢60%

Door Hangers.....50¢10¢60%

Stanley R. & L. Co.'s Butt and

Rabbit Gauge.....35%

Marking and Mortise.....60%

Wire, Brown & Sharpe's.....	25%
Wire, Morse's.....	25%
Wire, P. S. & W. Co.....	30%
Gimlets—Single Cut—	
Numbered assort-	
ments, per gro.	
Nail, Metal, No. 1, \$2.00; 2, \$2.30	
Spike, Metal, No. 1, \$4.00; 2, \$4.50	
Nail, Wood Handled, No. 1,	
\$2.50; 2, \$2.60	
Spike, Wood Handled, No. 1,	
\$4.50; 2, \$4.60	

Glass, American Window

See Trade Report.

Glasses, Level—

Chapin-Stephens Co.....60¢10¢10%

Glue, Liquid Fish—

Bottles or Cans, with Brush.....

25¢10¢50%

International Glue Co. (Martin's).....40%

Grease, Axle—

Common Grade.....gro. \$4.50\$6.00

Dixon's Everlasting.....1b. pails, 25¢

Dixon's Everlasting in boxes, 1 doz.

1 lb. \$1.20; 2 lb. \$2.00

Helmet Hard Oil.....25%

Griddles, Soapstone—

Pike Mfg. Co.....33¢10¢33¢10%

Grindstones—

Bicycle Emery Grinder.....\$4.50

Bicycle Grindstones, each.....\$2.50\$3.00

Pike Mfg. Co.:.....

Improved Family Grindstones,

per inch, 1/2 doz.....\$2.00

Pike Mower and Tool Grinder.....

\$4.00

Grips, Nipple—

Perfect Nipple Grips.....40¢10¢2%

Halters and Ties—

Cow Ties.....60¢10¢60¢10%

Covert Mfg. Co.:.....

Jute Rope.....45%

Sisal Rope.....33%

Cotton Rope.....45%

Hemp Rope.....45%

Covert's Saddlery Works:

Web and Leather Halters.....70%

Jute and Manila Rope Halters.....70%

Sisal Rope Halters.....60¢20%

Jute, Manila and Cotton Rope

Ties.....70%

Sisal Rope Ties.....60¢10%

Oneida Community:

Am. Coil and Halters.....40¢40¢5%

Am. Cow Ties.....45¢50%

Niagara Coil and Halters.....45¢50%

Niagara Cow Ties.....45¢50%

E. T. Rugg & Co.:.....

Leather Halters.....50%

Web Halters and Webbing.....60%

Jute and Sisal Rope Halters.....60%

Jute and Sisal Horse and Cattle

Ties.....60%

Cotton Horse Ties.....60%

Livery Ties, Braided.....60%

Hammers—

Handled Hammers—

Heller's Machinists'.....40¢10¢40¢10%

Heller's Farriers'.....40¢10¢40¢10%

Magnetic Tack, Nos. 1, 2, 3, \$1.25

\$1.50, \$1.75, \$2.00, \$2.25, \$2.50

Pech Stow & Wilcox, Steel.....50%

Fayette R. Plumb:

Plumb, A. E. Nail.....

33¢4¢10¢33¢4¢10¢17¢15%

Engineers' and B. S. Hand.....

50¢75¢50¢50¢10¢75¢45%

Machinists' Hammers.....50¢50¢10%

Riveting and Timers.....40¢25%

Sargent's C. S. New List.....40%

Heavy Hammers and Sledges—

Under 3 lb., per lb., 50¢.....80¢10%

3 to 5 lb., per lb., 40¢.....80¢10%

Over 5 lb., per lb., 30¢.....80¢10%

Wilkinson's Smith's.....lb. 9¢10¢10%

Handles—

Agricultural Tool Handles

Axe, Pick, &c.....60¢10¢60¢10%

Hoe, Rake, &c.....45¢50%

Fork, Shovel, Spade, &c.:.....

Long Handles.....45¢50%

D Handles.....50¢50¢5%

Cross-Cut Saw Handles

Atkins.....40%

Champion.....45¢45¢10%

Disston's.....50%

Mechanics' Tool Handles

Assorted.....gro. \$2.50\$3.00

Brad Axl.....gro. \$1.65\$1.75

Chisel Handles:

Apple Tanged Firmer, gro.

assorted.....\$2.40\$2.65

Hickory Tanged Firmer, gro.

assorted.....\$2.15\$2.40

Apple Socket Firmer, gro.

assorted.....\$1.75\$1.95

Hickory Socket Firmer, gro.

assorted.....\$1.15\$1.60

Hickory Socket Framing, gro.

assorted.....\$1.60\$1.75

File, assorted.....gro. \$1.30\$1.40

Hammer, Hatchet, &c.....

60¢10¢60¢10%

Hand Saw, Varnished.....65¢75¢

80¢85¢; Not Varnished.....65¢75¢

Jack, doz. 30¢; Jack, Bolted 75¢

Fore, doz. 45¢; Fore, Bolted 90¢

Chapin-Stephens Co.:.....

Carving Tool.....40¢10¢10%

Chisel.....65¢65¢10%

File and Awl.....65¢65¢10%

Saw and Plane.....40¢40¢10%

Screw Driver.....40¢40¢10%

Millers Falls Adj. and Ratchet Auger

Handles.....15¢10%

Nicholson Simplicity File Handle.....

per gro. \$0.35\$1.50

Hangers—

NOTE.—Barn Door Hangers are

generally quoted per pair, without track,

and Parlor Door Hangers per double set

with track, &c.

Allith Mfg. Co.:	
Reliable, No. 1.....	per doz. \$8.00
Reliable, No. 2.....	per doz. \$8.00
Chicago Spring Butt Co.:	
Friction.....	25%
Oscillating.....	25%
Big Twin.....	25%
Chisholm & Moore Mfg. Co.:	
Baggard Car Door.....	50%
Elevator.....	30%
Railroad.....	50%
Cronk & Carrier Mfg. Co.:	
Loose Axle.....	60&10%
Roller Bearing.....	70%
Griffin Mfg. Co.:	
Solid Axle, No. 19, \$12.00.....	70%
Roller Bearing, No. 11, \$15.00.....	70%
Roller Bearing, Ex. Hy., No. 22, \$18.00.....	10%
Hinged Hangers, \$18.00.....	60&10%
Lane Bros. Co.:	
Parlor, Ball Bearing.....	\$4.00
Parlor, Standard.....	\$3.15
Parlor, No. 108.....	\$2.85
Parlor, New Model.....	\$2.80
Parlor, New Chicago.....	\$2.80
Barn Door, Standard.....	60&5%
Hinged.....	net \$6.40
Covered.....	60&2%
Special.....	70&5%
Lawrence Bros.:	
Advance.....	60&10%
Chisel.....	75%
Clipper, No. 75.....	60&10%
Crown.....	60&10%
Easy Parlor Door, Dbl. Sets, \$2.50; Single Sets, \$1.25.....	
Giant.....	60&5%
Hummer.....	70&5%
New York.....	60&5%
Peerless.....	75%
Sterling.....	60&10%
McKinney Mfg. Co.:	
No. 1, Special, \$15.....	60&10%
No. 2, Standard, \$18.....	60&10%
Hinged Hanger, \$16.....	50%
Memorayon Hangers.....	60&5%
Richards Mfg. Co.:	
Hangers, Nos. 47, 48, 117, 247.....	
	60&5%

Screw Hook { 6 to 12 in. lb. 3¢
and Strap. { 1 1/2 to 20 in. lb. 3¢
{ 22 to 36 in. lb. 3¢
Screw Hook and Eye:
1/2 to 1 inch.....lb. 6¢
1/2-inch.....lb. 7¢
1-inch.....lb. 8¢

Hitchers, Stall—
Covert Mfg. Co., Stall Hitchers.....30¢2¢
Hods— Coal—

Inch.....15 16 17 18
Gate, Open.....\$2.50 2.75 3.00 3.25
Jap. Open.....\$1.90 2.10 2.25 2.55
Jap. Funnel.....\$2.40 3.30 3.60 3.90
Funnel.....\$2.45 2.65 2.85 3.30

Masons' Etc.—
Cleveland Fire Spring Co.:
Steel Brick, No. 162.....each \$0.95
Steel Mortar, No. 158.....each \$1.25

Hoes— Eye—
Scovill and Oval Pattern.....
60¢10¢60¢10¢10¢
Grub, lat Feb. 23, 1899.....
70¢10¢75¢10¢
D. & H. Scovill.....33¢4¢

Handled—
NOTE.—Manufacturers are selling
from the list of September 1, 1904,
but many jobbers are still using list of
August 1, 1899, or selling at net prices.

Cronk's Weeding No. 1, \$2.00; No. 2, \$2.25
Ft. Madison Cotton Hoe.....70¢10¢10¢
Ft. Madison Crescent Cultivator Hoe.....
70¢10¢10¢
Ft. Madison Mattock Hoe.....70¢10¢10¢

Regular Weight.....doz. 60¢
Junior Size.....doz. 40¢
Ft. Madison Sprouting Hoe.....doz. 50¢
Ft. Madison Dixie Tobacco Hoe.....
70¢10¢10¢
Kretzinger's Cut Easy.....70¢10¢10¢

Warren Hoe.....45¢10¢
W. & C. Ivanhoe.....75¢10¢
B. B. 6 in. Cultivator Hoe.....\$3.15
B. B. 6 1/2 in. do.....\$3.35
Acme Weeding.....doz. \$4.35
W. & C. L. t'ing shute Hoe.....doz. \$4.85

Hoisting Apparatus—
See Machines, Hoisting.
Holders— Bit—

Angular, doz. \$24.00.....45¢10¢
Door—
Bardsley's.....45¢
Empire.....50¢
Pullman.....30¢
Superior.....33¢4¢

File and Tool—
Nicholson File Holders and File
Handles.....33¢4¢10¢
Fruit Jar—
Triumph Fruit Jar Holder, 7 gross,
\$10.80; 7 doz.....\$1.25

Hones—Razor—
Pike Mfg. Co., Belgian, German and
Swat.....50¢
Hooks—Cast Iron—

Bird Cage, Reading.....40¢
Bird Cage, Sargent's List.....60¢10¢
Ceiling, Sargent's List, Nos. 29, 32,
33, 129, 132, 133 and 135.....50¢10¢10¢
Clothes Line, Reading List.....40¢
Clothes Line, Sargent's List.....50¢10¢
Coat and Hat, Sargent's List.....50¢10¢
Clothes Line, Stowell's.....70¢
Coat and Hat, Reading.....45¢20¢
Coat and Hat, Stowell's.....70¢
Coat and Hat, Wrightsville.....65¢
Harness, Reading List.....40¢
Harness, Stowell's.....70¢
School House, Stowell's.....70¢

Wire—
Belt.....80¢10¢10¢
Wire C. & H. Hooks.....
75¢10¢75¢10¢10¢
Columbian Hdw Co., Gem.....70¢10¢
Parker Wire Goods Co., King.....70¢10¢
Van Wagoner, Coat and Hat.....70¢
Western W. G. Co. Molding.....75¢
Wire Goods Co.:
Acme.....60¢10¢
Chief.....70¢
Crown.....75¢
Czar.....65¢
V Brace.....75¢
Czar Harness.....50¢10¢

Wrought Iron—
Boz, 6 in., per doz., \$1.00; 8 in.,
\$1.25; 10 in., \$2.50.
Cotton.....doz. \$1.05@1.15
Wrought Staples, Hooks, &c.—
See Wrought Goods.

Miscellaneous—
Hooks, Bench, see Stops, Bench.
Bush, Light, doz. \$1.75; Medium,
\$5.35; Heavy, \$6.25
Grass, best, all sizes, per doz. \$1.60
Grass, common grades, all sizes,
per doz.....\$1.30
Whiffletree.....lb. 5¢@6¢
Hooks and Eyes:

Brass.....60¢5¢60¢10¢45¢
Malleable Iron.....70¢10¢10¢
Covert Mfg. Co. Gate and Scuttle
Hooks.....40¢
Covert Saddlery Works Self Locking
Gate and Door Hook.....60¢
Ft. Madison Cut-Easy Corn Hooks,
doz. \$3.25 net

Bench Hooks—See Bench Stops.
Corn Hooks—See Knives, Corn.

Horse Nails—
See Nails, Horse.
Horsehoes—
See Shoes, Horses.

Hose, Rubber—
Garden Hose, 3/4-inch:
Competition.....ft. 5 @ 6¢
5-ply Guaranteed.....ft. 8 @ 9¢
1-ply Guaranteed.....ft. 10 @ 11¢
Cotton Garden, 3/4-in., coupled:
Low Grade.....ft. 8 @ 9¢
Fair Quality.....ft. 10 @ 11¢

Irons— Sad—
From 4 to 10.....lb. 3 @ 3 1/4¢
R. B. Sad Irons.....lb. 3 1/4 @ 3 1/2¢

Mrs. Potts, cents per set:
Nos.50 55 60 65
Jap'd Tops.....65 65 75 75
Tind Tops.....71 68 81 78
New England Pressing, lb. 3¢4¢

Pinking—
Pinking Irons.....doz. 60¢
Irons, Soldering
See Copiers.

Jacks, Wagon—
Covert Mfg. Co.:
Auto Screw.....30¢2¢
Steel.....45¢
Covert's Saddlery Works:
Daisy.....60¢10¢
Victor.....60¢
Lockport.....60¢
Lane's Steel.....doz. 30¢10¢
Richards' Tiger Steel, No. 130.....50¢10¢
Smith & Hemenway Co.'s.....25¢

Kettles—
Brass, Spun, Plain.....20¢25¢
Enamel and Cast Iron—See Ware,
Hollow.

Knives—
Butcher, Kitchen, &c.—
Foster Bros. Butcher, &c.....30¢
Wilkinson Shear & Cutlery Co.....00¢

Corn—
Wilkinson Wilcut Brand Knives and
Hooks.....60¢
Withington Acme, do doz. \$2.60
Dent, \$2.75; Adj. Serrated, \$2.20;
Serrated, \$2.10; Yankee No. 1, \$1.50;
Yankee No. 2, \$1.15.

Drawing—
Standard List.....75¢5¢75¢10¢
C. E. Jennings & Co., Nos. 45, 46, 60,
Jennings & Griffin, No. 41, 42.....60¢
Ohio Tool Co.'s.....70¢
Swan's.....75¢
Watrous's.....15¢
L. & I. J. White.....20¢45¢25¢

Hay and Straw—
Serrated Edge, per doz. \$5.75@6.00
Iwan's Sickle Edge.....doz. \$9.50
Iwan's Serrated.....doz. \$10.00

Mincing—
Buffalo.....7 gro. \$13.00
Miscellaneous—
Farriers.....doz. \$3.00@3.25
Westenholm's.....doz. \$3.00@3.25

Knobs—
Base, 2 1/2-inch, Birch, or Maple,
Rubber Tip.....gro. \$1.25@1.50
Carriage, Jap., all sizes.....
gro. 40¢45¢

Door, Mineral.....doz. 65¢70¢
Door, Por. Jap'd.....doz. 70¢75¢
Door, Por. Nickel.....doz. \$2.05@2.15
Barley's Wood Door, Shutters, &c. 15¢
Picture, Sargent's.....60¢10¢10¢

Lacing, Leather—
See Belting, Leather.

Ladders, Store, &c.—
Lane's Store.....25¢
Myers' Noiseless Store Ladders.....50¢
Richards' Mfg. Co.:
Improved Noiseless, No. 112.....50¢
Climax Shelf, No. 113.....50¢
Trolley, No. 109.....50¢

Ladies, Melting—
L. & G. Mfg. Co. (low list).....25¢
P. S. & Co.....50¢
Reading.....60¢
Sargent's.....50¢10¢

Lanterns—Tubular—
Regular Tubular, No. 0.....
doz. \$4.25@4.50
Lift Tubular, No. 0.....doz. \$4.75@5.00
Hinge Tubular, No. 0.....doz. \$4.75@5.00
Other Styles.....doz. \$4.75@5.00

Bull's Eye Police—
No. 1, 2 1/2-inch.....\$2.75@3.00
No. 2, 3-inch.....\$3.00@3.25

Lasts and Stands, Shoe—
Stowell's Atlas, Malleable Iron.....50¢
Stowell's Badger, Cast Iron.....50¢

Latches—Thumb—
Roggin's Latches, with screw.....
doz. 35¢40¢
Door—
Cronk & Carrier Mfg. Co., No. 101,
doz. \$2.30
Cronk & Carrier Mfg. Co., Latch,
Haap and Staples.....50¢
Richards' Bull Dog, Heavy, No. 125,
doz. \$5.05
Richards' Trump, No. 127.....\$1.50

Leaders, Cattle—
Small.....doz. 50¢; large, 60¢
Covert Mfg. Co.:
Cotton, Hemp and Jute, 45%;
Sisal, 33¢4¢

Lifters, Transom—
R. E.....33¢4¢
Lines—
Wire Clothes, Nos. 18 19 20
100 feet.....\$2.25 2.00 1.75
75 feet.....\$1.75 1.35 1.10
Anniston Waterproof Clothes, 50 ft.,
gro. \$23.00; Gilt Edge, \$23.00; Air
Line, \$23.00; Acme, \$18.00; Alabama,
\$17.00; Empire, \$16.00; Advances,
\$14.00; Eclipse, \$13.50; Chicago,
\$11.50; Standard, \$10.50; Columbia,
\$9.50; Allison, \$13.50; Calhoun, \$12.00.
Samson Cordage Works:
Solid Braided Chalk, Nos. 0 to 3, 40%
Silver Lake Braided Chalk, No. 0,
\$8.00; No. 1, \$6.50; No. 2, \$7.00; No. 3,
\$7.50.....doz. 20¢
Masons' Lines, Shade Cord, &c.:
White Cotton, No. 3 1/4, \$1.50; No. 4,
\$2.00; No. 4 1/2, \$2.50; Colors, No. 3 1/4,
\$1.75; No. 4, \$2.25; No. 4 1/2, \$2.75;
Linen, No. 3 1/4, \$2.50; No. 4, \$3.50;
No. 4 1/2, \$4.50.....doz. 20¢
Tent and Awning Lines: No. 5,
White Cotton, \$7.50; Drab Cotton,
\$8.50.....doz. 20¢
Clothes Lines, White Cotton: 50 ft.,
\$2.75; 60 ft., \$3.25; 70 ft., \$3.75;
100 ft., \$4.00; 80 ft., \$4.25; 90 ft., \$4.75;
100 ft., \$5.25.....doz. 20¢

Locks— Cabinet—
Cabinet Locks.....33 1/2¢@33 1/2¢47 1/2¢
Door Locks, Latches, &c.—
NOTE.—Net Prices are very often made
on these goods.

Reading Hardware Co.....40¢
R. & E. Mfg. Co.....40¢
Sargent & Co.....40¢10¢
Stowell's Steel Door Latches.....50¢

Elevator—
Stowell's.....50¢

Padlocks—
Wrought Iron.....75¢10¢45¢80¢45¢
Net prices are general.
R. & E. Mfg. Co. Wrought Steel and
Brass.....75¢10¢

Sash, &c.—
Ives' Patent:
Bronze and Brass.....62 1/2¢
Crescent.....50¢10¢
Iron.....62 1/2¢
Window Ventilating.....60¢
Robison Patent Ventilating Sash
Lock.....40¢
Wrought Bronze and Brass.....55¢
Wrought Steel.....55¢
Pullman Patent Ventilating Lock.....25¢
Reading.....40¢

Machines—Boring—
Com. Up'r, without Augers.....\$2.00
Com. Ang'r, without Augers.....\$2.25
Swan's Improved.....40¢10¢
Angular:
Jennings' Nos. 1 and 4.....35¢45¢
Millers' Falls.....8.75
Snell's, Rice's Pat. 2.50.....2.75

Corking—
Reisinger Invincible Hand Power.....
doz. \$18.00

Fence—
Williams' Fence Machines.....each, \$5.50

Hoisting—
Moore's Anti-Friction Differential
Pulley Block.....\$51.00
Moore's Hand Hoist, with Lock
Brake.....20¢

Ice Cutting—
Chandler's.....12 1/2¢
Washing—
Boss Washing Machine Co.: Per doz.
Boss No. 1.....\$51.00
Boss Rotary.....\$54.00
Champion Rotary Banner No. 1.....\$54.00
Standard Champion No. 1.....\$48.00
Standard Perfection.....\$26.00
Cint. Square Western.....\$30.00
Uneda American, Round.....\$30.00

Mallets—
Hickory.....45¢5¢50¢
Lignumvita.....45¢5¢50¢
Tinners' Hickory and Apple-
wood.....doz. 45¢5¢50¢

Mangers, Stable—
Sweet Iron Works.....50¢

Mashers, Vegetable—
Western, W. G. Co., Potato.....60¢10¢

Mats, Door—
Elastic Steel (W. G. Co.), new list.....
50¢10¢

Keystone Wire Matting Co.:
Keystone.....50¢
Ideal.....50¢

Mattocks—
See Picks and Mattocks.

Milk Cans—See Cans, Milk.

Mills, Coffee, &c.—
Enterprise Mfg. Co.....25¢30¢
National list Jan. 1, 1902.....30¢
Parker's Columbia & Victoria.....50¢10¢60¢
Parker's Box and Side.....50¢10¢60¢
Swift, Lane Bros. Co.....30¢

Mowers, Lawn—
NOTE.—Net prices are generally quoted
Cheapset.....all sizes, \$1.85@2.00
Cheap.....all sizes, \$2.00@2.50
Better Grade.....all sizes, \$2.50@4.50
12 14 16 18-in.
High Grade.....\$4.50 4.75 5.00 5.25
Continental.....60¢5¢
Great American.....70¢
Great American Ball B'r'g, new list.....70¢
Quaker City.....60¢5¢
Pennsylvania, Jr. Ball Bearing.....60¢
Pennsylvania Gold.....50¢
Pennsylvania Horse.....30¢45¢
Pennsylvania Pony.....40¢5¢
Granite State:
Style A, Low Wheel.....70¢10¢10¢45¢
Style B, Low Wheel.....70¢10¢45¢
Style C, High Wheel.....70¢10¢
Style D, High Wheel.....70¢

Philadelphia:
Styles M. S. C. K. T.....70¢45¢
Style A, all Steel.....60¢45¢
Style E, High Wheel.....70¢10¢45¢
Drexel and Gold Coin, special list.....50¢

Nails—
Wire Nails and Brads, Miscel-
laneous.....85¢10¢85¢10¢45¢
Cut and Wire. See Trade Report.
Hungarian, Finishing, Upholster-
ers' &c. See Tacks.

Horse—
Nos. 6 7 8 9 10
Anchor.....23 21 20 19 18.....40¢45¢
Chaplain.....28 26 25 24 23.....50¢
Coleman.....13 12 11 11.....net
New Haven.....23 21 20 19 18.....40¢45¢
Putnam.....23 21 20 19 18.....33¢4¢
New Putnam.....19 18 17 16 16.....10¢10¢
Western.....19 18 17 16 16.....10¢10¢
Jobbers' Special Brands.....per lb. 9¢@10¢

Picture—
1 1/2 2 2 1/2 3 3 1/2 in.
Brass Hd. 15 55 60 70 ..gro
Por. Head... 1.10 1.10 1.10 ..gro

Nippers—
See Pliers and Nippers.

Nuts—
Gold Punched: Off list.
Square, Blank or Tapped.....
4.90¢5.00¢
Hexagon, Blank or Tapped.....
5.30¢5.40¢

Square, Blank, C. & T. 5.20¢5.30¢
Hexagon, Blank, C. & T.....
5.90¢6.00¢

Hot Pressed:
Square, Blank.....5.10¢5.20¢
Hexagon, Blank.....5.50¢5.60¢
Square, Tapped.....5.00¢5.10¢
Hexagon, Tapped.....5.40¢5.50¢

Oakum—
Best.....lb. 6 1/4¢@6 1/2¢
U. S. Navy.....lb. 5 1/2¢@6¢
Navy.....lb. 4 1/4¢@5¢
Plumbers' Spun Oakum.....2 1/2¢@3¢
In carload lots 1/4 lb. off, f.o.b.
New York.

Oil Tanks—See Tanks, Oil.

Oilers—
Brass and Copper.....60¢10¢
Tin or Steel.....70¢70¢45¢
Zinc.....70¢70¢45¢
Chase or Paragon:
Brass and Copper.....50¢10¢
Tin or Steel.....65¢10¢
Zinc.....65¢10¢
Malleable, Hammers' Imp'd, Nos.
11, 12 and 13.....20¢
Malleable, Hammers' Old Pattern,
Nos. 1, 2 and 3.....50¢
American Tube & Stamping Co.:
Spring Bottom Cans.....70¢10¢10¢
Railroad Oilers, &c.....60¢60¢10¢

Openers—Can— Per doz.
Sprague, Iron Handle.....30¢35¢
Sprague, Wood Handle.....35¢40¢
Sardine Scissors.....\$1.75@3.00
National.....50¢10¢
Stowell's Sprague.....doz. 35¢45¢
Vim Tin Shear and Can Opener,
doz. 75¢; per gro., \$7.50

Egg—
Nickel Plate.....doz. \$2.00
Silver Plate.....doz. \$4.00

Packing—
Asbestos Packing, Wick and
Rope.....17¢@22¢

Rubber—
(Fair quality goods.)
Sheet, C. I.....11¢@12¢
Sheet, C. O. S.....11¢@12¢
Sheet, C. B. S.....12¢@13¢
Sheet, Pure Gum.....10¢@15¢
Sheet, Red.....40¢50¢
Jenkins' '96, 10 lb 80¢.....25¢25¢

Miscellaneous—
American Packing.....lb. 7¢@10¢
Cotton Packing.....lb. 16¢@25¢
Italian Packing.....lb. 9¢@12 1/2¢
Jute.....lb. 4¢@4 1/2¢
Russia Packing.....lb. 8¢@11¢

Pails, Creamery—
R. M. Co., with gauges—No. 1,
\$6.25; No. 2, \$6.50 per doz.

Pails, Water, Well, &c.—
See Buckets.

Pans—Dripping—
Standard List.....65¢10¢

Fry—
Nos.1 2 3 4 5
Per doz. \$0.75 0.80 0.90 1.10 1.30

Refrigerator, Galva—
Inch.....12 14 16 18
Per doz.....\$1.95 2.25 2.80 3.15

Roasting and Baking—
Royal, R. M. Co., 7 doz., Nos. 5,
\$1.50; 10, \$5.25; 20, \$5.75; 30, \$6.25.
Savory 30 doz., net, Nos. 200, \$9.00;
400, \$15.00.
Simplex, 30 gro.:
No. 40 50 60 140 150 160
\$30.00 35.00 42.00 34.00 39.00 46.00

Paper—Building Paper
Asbestos:
Roll Board or Building Felt,
6 to 30 lb., per 100 sq. ft. 6¢
Roll Board or Building Felt,
3-32 and 1/2 in., 45 to 60 lbs.,
per 100 sq. ft.8¢
Mill Board, Sheet, 40 x 40
in., 1-32 to 1/2 in.10¢

Rosin Sized Sheathing: 500 sq. ft.
Light weight, 25 lbs. to roll
.....35¢40¢
Medium weight, 30 lbs. to roll,
.....40¢45¢
Heavy weight, 40 lbs. to roll,
.....50¢60¢

Black Water Proof Sheathing,
500 sq. ft., 1 ply, 65¢; 2 ply,
85¢; 3 ply, \$1.10; 4 ply, \$1.25.
Deafening Felt, 9, 6 and 1 1/2 sq.
ft. to lb. ton.....\$18.00
Red Rope Roofing, 250 sq. ft.
per roll.....\$1.75

Tarred Paper—
1 ply (roll 300 sq. ft.), ton.....
\$32.50@35.50
2 ply, roll 108 sq. ft.55¢
3 ply, roll 108 sq. ft.75¢
Slater's Felt (roll 500 sq. ft.), 70¢

Sand and Emery—
Flint Paper and Cloth.....60¢60¢10¢
Garnet Paper and Cloth.....25¢
Emery Paper and Cloth.....60¢60¢10¢

Parers—Apple—
Advance.....doz. \$4.00
Baldwin.....doz. \$4.00
Bonanza Improved.....doz. \$6.50
Daisy.....doz. \$4.00
Dandy.....each \$7.50
Eureka Improved.....each \$20.00
Family Bay State.....doz. \$15.00
Improved Bay State.....doz. \$36.00
Little Star.....doz. \$5.00
New Lightning.....doz. \$7.00
Pecding 72.....doz. \$3.25

Reading 78.....	doz.	\$6.25
Rocking Table.....	doz.	\$6.25
Turn Table.....	doz.	\$6.25
White Mountain.....	doz.	\$5.00

Potato—		
Saratoga.....	doz.	\$7.00
White Mountain.....	doz.	\$6.00

Picks and Mattocks—		
List Feb. 23, 1899.....	75%	
Cronk's Handled Garden Mattock.....	33%	

Pinking Irons—		
See Irons, Pinking.....		

Pins, Escutcheon—		
Brass.....	60@60&10%	
Iron, list Nov. 11, '85.....	60@60&10%	

Pipe, Cast Iron Soil—		
Carload lots.....		

Standard, 2-6 in. 50&10&10%		
Extra Heavy, 2-6 in. 6&10%		
Fittings.....	70&10@70&10&5%	

Pipe, Merchant—		
Consumers, Carloads.....		

Steel.....		
Blk. Galv. Blk. Galv.		

1/4 & 3/4 in. 71% 55% 68% 52%		
3/4 in. 73% 59% 72% 56%		
1 in. 75% 63% 74% 60%		
1 1/4 to 6 in. 79% 69% 76 1/2% 66 1/4%		
7 to 12 in. 74% 59% 71 1/2% 56%		

Pipe, Vitrified Sewer—		
Carload lots.....		

Standard Pipe and Fittings, 2 to 24 in.—		
New England.....	68%	
New York and New Jersey.....	71%	
Maryland, Delaware, E. Pa. 75%		
West. Pa. and West Va. 76%		
Virginia.....	77%	
Ohio, Michigan and Ky. 77%		
Indiana.....	77%	

NOTE—Carload lots are generally delivered.		
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Pipe, Stove—		
Edwards' Nested Stove Pipe.....		

C. L. L. C. L.		
5 in., per 100 joints.....	\$7.00	\$8.00
6 in., per 100 joints.....	7.50	8.50
7 in., per 100 joints.....	8.50	9.50

Planes and Plane Irons—		
Wood Planes.....		

Bench, first qual.	40&10%	
Bench, second qual.	40&10%	
Molding.....	33&10&10%	
Bailey's (Stanley R. & L. Co.).....	40%	

Chapin-Stephens Co.	40&10%	
Bench, first quality.....	40&10%	
Bench, second quality.....	50&10%	
Molding.....	33&10&10%	
Toy and German.....	40&10%	
Chaplin's.....	60%	
Ohio Tool Co.	40&10%	
Bench, first quality.....	40&10%	
Bench, second quality.....	50&10%	
Molding.....	33&10&10%	
Adjustable Wood Bottom.....	60%	
Union.....	60%	

Iron Planes—		
Bailey's (Stanley R. & L. Co.).....	40%	
Chaplin's Iron Planes.....	50&10%	
Miscellaneous Planes (Stanley R. & L. Co.).....	35%	
Ohio Tool Co.'s Iron Planes.....	60&10%	
Sargent's.....	60&10%	
Union.....	60%	

Plane Irons—		
Wood Bench Plane Irons.....	25&10&30%	

Buck Bros.....	30%	
Chapin-Stephens Co.	30&10%	
Ohio Tool Co.	30%	
Stanley R. & L. Co.	35%	
Union.....	60%	
L. & J. White.....	25&10&25%	

Planters, Corn, Hand—		
Kohler's Eclipse.....	doz.	\$8.50

Plates—		
Felcoe.....	lb.	4@4 1/4¢
Self-Sealing Pie Plates (H. M. Co.).....	doz.	\$2.00

Pliers and Nippers—		
Button Pliers.....	75&10@75, 10, 5%	
Gas Burner, per doz. 5 in., \$1.25		
@ \$1.30; 6 in., \$1.45 @ \$1.50.		
Gas Pipe.....	7 8 10 12-14	
Acme Nippers.....	\$2.00	\$2.25 \$3.00 \$3.75

Cronk & Carrier Mfg. Co.	50&5%	
American Button.....	75&10%	
Cronk's.....	60%	
Stub's Pattern.....	50%	
Combination and others.....	33&10%	
Heller's Farriers' Nippers, Pincers and Tools.....	40&10@40&10&10%	
The Nettleton Mfg. Co. Reversible Cutting Nippers.....	40%	
P. S. & W. Timmer's Cutting Nippers.....	40%	
Wm. Schollhorn Co.	33&10%	
Bernard.....	33&10%	
Elm City.....	33&10%	
Lodi.....	50%	
Paragon.....	50%	
Swedish Slide, End and Diagonal Cutting Pliers.....	50%	
Utica Drop Forge & Tool Co.	40%	
Pliers and Nippers, all kinds.....	40%	

Plumbs and Levels—		
Chapin-Stephens Co.	30@30&10&10%	
Chapin's Imp. Brass Cor.	30@30&10&10%	
Pocket Levels.....	30@30&10&10%	
Diston's Plumbs and Levels.....	70%	
Diston's Pocket Levels.....	70%	
C. E. Jennings & Co.'s Iron, Adjustable.....	30&10%	
C. E. Jennings & Co.'s Iron, Adjustable.....	30&10%	
Stanley R. & L. Co.	40%	
Stanley's Duplex.....	35%	
Woods' Extension.....	33&10%	

Poachers, Egg—		
Buffalo Steam Egg Poachers, doz. No. 1, \$6.00; No. 2, \$9.00; No. 3, \$9.00; No. 4, \$12.00.....		50%

Points, Glaziers—		
Bulk and 1-lb. papers.....	lb.	10¢
1/4-lb. papers.....	lb.	9¢@10¢
1/4-lb. papers.....	lb.	8¢@11¢

Pokes, Animal—		
Ft. Madison Hawkeye.....	doz.	\$3.25
Ft. Madison Western.....	doz.	\$4.00

Police Goods—		
Manufacturers' Lists.....	25@25&5%	
Tower's.....	25%	

Polish—Metal, Etc—		
Glasbrite, No. 2, 5 lb. can (powder), each, \$1.25; doz., \$12.00; No. 2, 10 lb. can (cake), each, \$2.50; doz., \$24.00.		
Prestoline Liquid, No. 1 (1/2 pt.), doz., \$3.00; No. 2 (1 qt.), \$9.72.....	40%	
Prestoline Paste.....	40%	
George William Hoffman:		
U. S. Metal Polish Paste, 3 oz. boxes, doz. 50¢; doz. gro. \$4.50;		
1/2 lb. boxes, doz. \$1.25; 1 lb. boxes, doz. \$2.25.		
U. S. Liquid, 8 oz. cans, doz. \$1.25; doz. gro. \$12.00.		
Barkeepers' Friend Metal Polish, doz. \$1.75; doz. gro. \$18.00.		
Wynn's White Silk, 1/2 pt. cans, doz. \$2.00.....	20%	

Stove—		
Black Eagle Benzine Paste, 5 lb. cans, doz. \$1.50; doz. gro. \$15.00;		
Black Eagle, Liquid, 1/2 pt. cans, doz. \$1.25; doz. gro. \$12.00.		
Black Jack Paste, 1/2 lb. cans, doz. \$2.50; doz. gro. \$24.00.		
Black Kid Paste, 5 lb. cans, each, \$0.65; doz. \$6.50.		
Ladd's Black Beauty Liquid, per 100 tins.....	\$6.75	
Joseph Dixon's, doz. gr. \$5.75.....	10%	
Dixon's Plumbago.....	doz. \$8.00	
Fireaid.....	doz. \$2.50	
Gem, doz. gr. \$4.50.....	10%	
Japanese.....	doz. \$3.50	
Jet Black.....	doz. gr. \$3.50	
Peerless Iron Enamel, 10 oz. cans, doz. \$1.50.....	10%	

Wynn's:		
Black Silk, 5 lb. pail.....	each 70¢	
Black Silk, 1/2 lb. box.....	doz. \$1.00	
Black Silk, 5 oz. box.....	doz. \$0.75	
Black Silk, 1/2 pt. liq.....	doz. \$1.00	

Poppers, Corn—		
1 qt., Square.....	gro.	\$9.00
1 qt., Round.....	gro.	\$10.00
1 1/2 qt., Square.....	gro.	\$11.00
2 qt., Square.....	gro.	\$13.00

Post Hole and Tree Augers and Diggers—		
See also Diggers, Post Hole, &c.		

Posts, Steel—		
Steel Fence Posts, each, 5 ft., 42¢; 6 ft., 46¢; 6 1/2 ft., 48¢.		
Steel Hitching Posts.....	each \$1.30	

Potato Parers—		
See Parers, Potato.		

Pots, Glue—		
Enamelled.....	40%	
Tinned.....	35%	

Powder—		
In Canisters:		

Dunk, 1 lb.....	each 45¢	
Fire Sporting, 1 lb.....	each 75¢	
Rifle, 1/2 lb.....	each 15¢	
Rifle, 1 lb.....	each 25¢	

In Kegs:		
12 1/2-lb. kegs.....	\$3.50	
25-lb. kegs.....	\$4.50	
King's Semi-Smokeless:		
Keg (25 lb bulk).....	\$6.50	
Half Keg (12 1/2 lb bulk).....	\$3.50	
Quarter Keg (6 1/4 lb bulk).....	\$1.90	
Case 21 (1 lb cans bulk).....	\$4.50	
Half case (1 lb cans bulk).....	\$4.50	
King's Smokeless: Shot Gun Rifle.		
Keg (25 lb bulk).....	\$12.00	
Half Keg (12 1/2 lb bulk).....	6.25 7.75	
Quarter Keg (6 1/4 lb bulk).....	3.25 4.00	
Case 21 (1 lb cans bulk).....	14.00 17.00	
Half case 12 (1 lb cans bulk).....	7.25 9.75	
Robin Hood Smokeless Shot Gun.....	50&20%	

Presses—		
Fruit and Jelly—		

Enterprise Mfg. Co.	20&25%	
Sea Presses—		
Morrill's No. 1, doz., \$20.00.....	50%	

Pruning Hooks and Shears		
See Shears.		

Pullers, Cork—		
Invincible Cork Puller.....	\$21.00	

Pullers, Nail—		
Cyclops.....	50%	
Miller's Falls, No. 3, doz., \$12.00.....	33&10%	
Morrill's No. 1, Nail Puller, doz. \$20.00.....	50%	
Pearson No. 1, Cyclone Spike Puller, each \$30.00.....	50%	
Scranton, Case Lots:		
No. 2B (large).....	\$5.50	
No. 2B (small).....	\$5.00	
Smith & Hemenway Co.:		
Diamond B. No. 2, case lots.....	doz. \$6.00	
Diamond B. No. 3, case lots.....	doz. \$5.50	
Giant No. 1, doz. \$18.00; No. 2, \$16.50; No. 3, \$15.....	33&10%	
Staple Pullers.....	60%	
Parrot Tack and Stub Puller, doz. 75¢; doz. gro. \$8.00.....		

Pulleys, Single Wheel—		
Inch.....	1 1/4 1 3/4 2 3	
Awning or Tackle.....	doz. \$0.30 .45 .60 1.03	
Hay Fork, Swivel or Solid Eye.....	doz., 4 in., \$1.25; 5 in., \$1.55	
Inch.....	2 1/4 2 1/2 3	
Hot House, doz.....	\$0.65 .85 1.80	
Inch.....	1 1/4 1 1/2 1 3/4 2	
Screw, doz.....	\$0.16 .19 .23 .30	
Inch.....	1 1/4 1 1/2 1 3/4 2	
Side, doz.....	\$0.25 .30 .35 .40	
Inch.....	1 1/4 1 1/2 1 3/4 2 1/4	

Stowell's:		
Ceiling or End, Anti-Friction.....	60&10%	
Dumb Waiter, Anti-Friction.....	60&10%	
Electric Light.....	60%	
Side, Anti-Friction.....	60&10%	

Sash Pulleys—		
Common Frame: Square or Round End, per doz, 1 1/4 and 2 in.....	16@19¢	
Auger Mortise, no Face Plate, per doz., 1 1/4 and 2 in.....	16@19¢	

Acme.....	1 1/4 in., 16¢; 2 in., 19¢	
Fox-All-Steel, Nos. 3 and 7.....	2 in., 19¢	

Grand Rapids All Steel Noiseless—		
Ideal.....	70&10%	
Niagara.....	1 1/4 in., 16¢; 2 in., 19¢	
No. 26, Troy.....	1 1/4 in., 14 1/2¢; 2 in., 16 1/2¢	
Star.....	1 1/4 in., 16¢; 2 in., 19¢	
Tackle Blocks—See Blocks.		

Pumps—		
Cistern.....	60@60&10%	
Pitcher Spout.....	80@80&10%	
Wood Pumps, Tubing, etc. 45@45&10%		
Barnes Dbl. Acting (low list).....	50%	
Barnes' Pitcher Spout.....	75&10&5%	
Contractors' Rubber Diaphragm No. 2, B. & L. Block Co.....	\$18.00	
Daily Spray Pump.....	doz. \$6.75	
Flint & Walling's, Fast Mail Hand (low list).....	55%	
Flint & Walling's Fast Mail (low list).....	55%	
Flint & Walling's Tight Top Pitcher.....	50%	
National Specialty Mfg. Co., Measuring, 60.00.....	30%	
Mechanical Sprayer.....	\$6.00	
Myers' Pumps (low list).....	50%	
Myers' Power Pumps.....	50%	
Myers' Spray Pumps.....	50&10%	

Pump Leathers—		
Plunger and Lower Valve—Per gro.:		

Inch.....	2 2 1/4 2 1/2 2 3/4 3.00	
Inch.....	\$2.80 2.50 2.75 3.00	
Inch.....	\$3.30 3.60 3.85 4.10 4.40	

Plunger Cup Leathers—Per 100:		
Inch.....	2 1/2 3 3 1/4 4	
Inch.....	\$2.75 3.85 5.00 6.00	

Punches—		
Saddlers' or Drive, good.....	doz. 50@75¢	

Spring, single tube, good quality.....		
Revolving (4 tubes).....	doz. \$3.50@3.75	

Bemis & Call Co.'s Cast St'l Drive.....	50%	
Bemis & Call Co.'s Check.....	55%	
McNeill's Nos. 1AA, 1A, 1B.....	50%	
Hercules, 1 die, each \$5.00.....	50%	
Niagara Hollow Punches.....	40%	
Niagara Solid Punches.....	55&10%	
Wm. Schollhorn Co.:		
Bernard.....	33&10%	
Lodi.....	50%	
Paragon.....	50%	
Steel Screw, B. & K. Mfg. Co.....	50%	
Tinner's Hollow, P. S. & W. Co.....	40%	
Tinner's Solid, P. S. & W. Co.....	doz. \$1.44.....	60%

Rail—Barn Door, &c.—		
Sliding Door, Painted Iron.....	2 1/4@2 3/4¢	

Sliding Door, Wrought Brass.....		
1 1/2 in., lb., 36¢.....	30%	

Inch...	2	2 1/4	2 1/2	2 3/4
	\$2.20	2.50	2.75	3.00

Rules

Boxwood	60¢@10¢10%
Ivory	35¢@10¢35¢10¢5%
Chapin-Stephens Co.	60¢@60¢10%
Boxwood	60¢@60¢10%
Flexiford	27¢@10¢10¢24%
Ivory	35¢@35¢10¢10%
Miscellaneous	50¢@50¢10¢10%
Combination	50¢@50¢10%
Stationers	10¢@10¢10%
Keuffel & Esser Co.	35¢@10%
Folding, Wood	35¢@10%
Folding, Steel	33¢@10%
Lufkin's Steel	50¢@10%
Lufkin's Lumber	60¢
Stanley R. & L. Co.	62¢@10%
Boxwood	60¢@10%
Ivory	45¢
Miscellaneous	60¢
Zig Zag	40¢
Zig Zag, Pin Joint	45¢@10%
Union Nut Co.	60¢@60¢10%
Boxwood	35¢@10¢35¢10¢10%
Ivory	35¢@10¢35¢10¢10%

Sash Balances—

See Balance, Sash.

Sash Locks—

See Locks, Sash.

Sash Weights—

See Weights, Sash.

Sausage Stuffers or Fillers

See Stuffers or Fillers, Sausage.

Saw Frames—

See Frames, Saw.

Saw Sets—See Sets, Saw.

Saw Tools—See Tools, Saw.

Saws—

Atkins:	50¢
Circular	50¢@10¢60%
Hand	35¢@5%
Cross Cuts	50¢@10%
Mulay, Mill and Drag	50¢
One-Man Saw	40¢
Wood Saws	40¢
Hand, Compass, &c.	40¢
Chapin-Stephens Co.	30¢@30¢10%
Turning Saws and Frames	30¢@30¢10%
Diamond Saw & Stamping Works	30¢@30¢10%
Sterling Kitchen Saws	30¢@30¢10%
Diaston's:	50¢
Circular, Solid and Ins'ted Tooth	50¢
Hand, 2 to 14 in. wide	60¢
Hand, 1/4 to 1 in.	60¢
Crosscuts	50¢
Narrow Crosscuts	50¢
Mulay, Mill and Drag	50¢
Framed Woodsaws	35¢
Woodsaw Blades	35¢
Woodsaw Rods	25¢
Hand Saws, Nos. 12, 9, 9, 16, 1100	25¢
D8, 120, 76, 77, 8	25¢
Hand Saws, Nos. 7, 107, 107 1/2, 3, 1	25¢
0, 00, Combination	25¢
Compass, Key Hole, &c.	25¢
Butcher Saws and Blades	35¢
C. E. Jennings & Co.'s:	25¢
Back Saws	25¢
Butcher Saws	25¢
Compass and Key Hole Saws	25¢
Framed Wood Saws	25¢
Hand Saws	20¢@2 1/2%
Wood Saw Blades	35¢
Millers Falls:	15¢@10%
Butcher Saws	15¢@10%
Star Saw Blades	15¢@10%
Peace & Richardson's Hand Saws	30¢
Simonds:	50¢
Circular Saws	50¢
Crescent Ground Cross Cut Saws	35¢
One-Man Cross Cuts	40¢@10%
Gang Mill, Mulay and Drag Saws	50¢
Band Saws	50¢
Back Saws	25¢@25¢1 1/2%
Butcher Saws	25¢@25¢1 1/2%
Hand Saws	25¢@25¢1 1/2%
Hand Saws, Bay State Brand	45¢
Compass, Key Hole, &c.	25¢@25¢1 1/2%
Wood Saws	35¢@35¢1 1/2%
Springfield Mach. Screw Co.	40¢@10¢50%
Diamond Kitchen Saws	40¢@10¢50%
Butcher Saws Blades	35¢@40%
Wheeler, Madden & Clemens Mfg. Co.'s Cross Cut Saws	50¢

Hack Saws

Atkins' Hack Saw Blades A A A	25¢
Diaston's:	25¢
Concave Blades	25¢
Keystone	40¢
Hack Saw Frames	30¢
Fitchburg File Works, The Best	35¢
C. E. Jennings & Co.	180
Hack Saw Frames, Nos. 175, 180	40¢@7 1/2%
Hack Saws, Nos. 175, 180, complete	40¢@7 1/2%
Goodell's Hack Saw Blades	40¢
Griffin's Hack Saw Frames	35¢@10%
Griffin's Hack Saw Blades	35¢@10%
Springfield Mach. Screw Co.	35¢
Diamond Hack Saw Blades	35¢
Diamond Hack Saw Frames	60¢
Star Hack Saws and Blades	15¢@10%
Sterling Hack Saw Frames	30¢@10¢10%
Sterling Power Hack Saw Machines	each, No. 1, \$25.00; No. 2, \$30.00. 10%
Victor Hack Saw Blades	25¢
Victor Hack Saw Frames	40¢

Scroll—

Barnes' No. 7, \$15	25¢
Barnes' Scroll Saw Blades	40¢
Barnes' Velocipede Power Scroll Saw	without boring attachment, \$20
with boring attachment, \$20	20¢
Lester, complete, \$10.00	15¢@10%
Rogers, complete, \$4.00	15¢@10%

Scalers, Fish—

Covert's Saddlery Works.....60¢@10%

Scales—

Family, Turnbull's	50¢@50¢10%
Counter:	
Hatch, Platform, 1/4 oz. to 1 lb.	10¢@10¢10%
Two Platforms, 1/4 oz. to 1 lb.	10¢@10¢10%
Union Platform, Std. \$1.70@1.90	10¢@10¢10%
Union Platform, Std. \$1.83@2.15	10¢@10¢10%
Castillon's	25¢
Eureka	40¢
Favorite	40¢
Crocker's Trip Scales	50¢
Chicago Scale Co.	50¢
The "Little Detective"	25¢@50%
Union or Family No. 2	50¢@50%

Portable Platform (reduced list).....50%
Wagon or Stock (reduced list).....25¢@35%
"The Standard" Portable.....50%
"The Standard" R. R. and Wagon.....50%

Scrapers—

Box, 1 Handle	10¢@2.25
Box, 2 Handle	10¢@2.25
Ship, Light, \$2.00; Heavy, \$1.50	
Adjustable Box Scraper (S. R. & L. Co.), \$6.00	10%
Chapin-Stephens Co., Box	30¢@30¢10¢10%

Screens, Window and

Frames—

Maine Screen Frames.....40¢@10¢5%

See also Doors.

Screws—Bench and Hand

Bench, Iron, doz., 1 in.	\$2.50@2.75
2 1/2; 1 1/2, \$3.00@3.25; 1 1/4, \$3.50@3.75	
Bench, W'd, Beech, doz.	30¢@30¢5%
Hand, Wood	30¢@30¢5%
R. Bliss Mfg. Co., Hand	30¢@30¢10%
Chapin-Stephens Co., Hand	30¢@30¢10%
Ohio Tool Co., Bench and Hand	30%
Coach, Lag and Hand Rail	10¢
Lag, Cone Point, list Oct. 1	75¢@15%
Coach, Gimlet Point, list Oct. 1	75¢@10%
Hand Rail, list Jan. 1	81¢@10%

Jack Screws—

Standard List	80¢@80¢5%
Millers Falls	50¢@10¢10%
Millers Falls, Roller	50¢@10%
P. S. & W.	50%
Sargent	70¢@10%
Sweet Iron Works	75¢@10¢80¢5%

Machine—

List Jan. 1, '98:

Flat or Round Head, Iron.....50¢@50¢10%

Flat or Round Head, Brass.....50¢@50¢10%

Set and Cap—

Set (Iron), nes advance over.....80%

Set (Steel), nes advance over.....25%

Sq. Hd. Cap.....75%

Hex. Hd. Cap.....75%

Rd. Hd. Cap.....60¢@10%

Fillister Hd. Cap.....60¢@10¢10%

Wood—

List July 23, 1903:

Flat Head, Iron.....87¢@10¢@.9

Round Head, Iron.....85¢@10¢@.9

Flat Head, Brass.....85¢@10¢@.9

Round Head, Brass.....80¢@10¢@.9

Flat Head, Bronze.....77¢@10¢@.9

Round Head, Bronze.....75¢@10¢@.9

Drive Screws.....87¢@10%

Scroll Saws—

See Saws, Scroll.

Scythes—

Grass, No. 1, Plain.....\$6.25@6.75

Clipper, Bronzed Webb.....\$6.50@7.00

No. 3 Clipper, Pol'd Webb.....\$6.75@7.25

No. 6 Clipper and Solid Steel.....\$7.00@7.50

Bush, Weed and Bramble, No. 2.....\$6.50@7.00

Grain, No. 1.....\$8.25@8.75

Bronzed Webb, No. 1.....\$8.50@9.00

Nos. 3 and 4 Clipper, Grain.....\$8.75@9.25

Solid Steel, No. 6.....\$9.25@9.75

Seeders, Raisin—

Enterprise.....25¢@30%

Sets—Awl and Tool—

Aiken's Sets, Awl and Tools:

No. 20, \$9 doz., \$10.00.....60¢@10%

Fray's Adj. Tool Handles, No. 1, \$12;

2, \$18; 3, \$12; 4, \$9; 5, \$7.....50%

C. E. Jennings & Co.'s Model Tool

Holders.....30%

Millers Falls Adj. Tool Handles, No.

1, \$12; No. 4, \$12; No. 5, \$18.....15¢@10%

Garden Tool Sets—

Ft. Madison Three Plows, Hoe, Rake

and Shovel.....\$9 doz sets \$9.00

Sets, Nail—

Octagon.....gro. \$3.50@3.75

Buck Bros.

Cameron's Diamond Point, \$9 doz. \$12.00

Mayhew's.....\$9 doz. \$9.00

Snell's Cor'gated, Cup Pt.....\$9 doz. \$7.20

Snell's Knurled, Cup Pt.....\$9 doz. \$7.20

Springfield Mach. Screw Co.

Diamond Knurled Cup Pt.....\$9 doz. \$7.50

Rivet—

Regular list.....75¢@75¢10%

Saw—

Aiken's:

Genuine.....50¢@10%

Imitation.....50¢@10%

Atkin's:

Criterion.....40%

Adjustable.....40%

Bemis & Call Co.'s:

Cross Cut.....30%

Plate.....20%

Diaston's Star and Monarch.....25%

Morrill's No. 1, \$15.00.....50%

Nos. 3 and 4, Cross Cut, \$20.00.....50%

Barnes' No. 5, Mill, \$20.....15%

No. 10, 11, 95, \$15.00.....50%

No. 1 Old Style, \$10.00.....50%

Special, \$18.25.....50%

Giant Royal Cross Cut.....\$9 doz. \$9.00

Royal, Hand.....\$9 doz. \$4.50

Taintor Positive.....\$9 doz. \$4.75

Fox Shaving Sets, No. 30.....\$9 doz. net \$24.00

Smith & Hemenway Co.'s.....60%

Sharpeners, Knife—

Chicago Wheel & Mfg. Co.....70%

Pike Mfg. Co.:

Fast Cut Pocket Knife Hones.....\$1.50

Mounted Kitchen Sand Stone.....\$1.50

Natural Grit Carving Knife.....\$3.00

Hones, \$9 doz.....\$3.00

Quick Cut Emery Carving Knife Hones, \$9 doz.....\$1.50

Quick Edge Pocket Knife Hones, \$9 doz.....\$2.50

Skate—

Smith & Hemenway Co.....20%

Shaves, Spoke—

Iron	10¢@1.10@1.25
Wood	10¢@1.15@1.25
Bailey's (Stanley R. & L. Co.)	45%
Razor Edge (Stanley R. & L. Co.)	35%
Chapin-Stephens Co.	30¢@30¢10¢10%
Goodell's, \$9 doz.	15¢@10%
Wood's Ft and F2	50%

Shears—

Cast Iron	7	8	9 in.
Best	\$16.00	18.00	20.00 gro.
Good	\$13.00	15.00	17.00 gro.
Cheap	\$5.00	6.00	7.00 gro.

Straight Trimmers, &c.—

Best quality Jap.	70¢@70¢10%
Best quality, Nickel	60¢@60¢10%
Fair quality, Jap.	80¢@80¢5%
Fair quality, Nickel	75¢@75¢10%
Tailors' Shears	40¢@40¢10%
Acme Cast Shears	40¢@40¢5%
Heinisch's Tailors' Shears	10%
Wilkinson's Sheep, 1500 list	30¢@10¢5%
Grass, 50¢10%; Horse or Mule, 50¢10%	

Tinner's Snips—

Steel Blades	20¢@20¢10%
Steel Laid Blades	40¢@40¢50%
Forged Handles, Steel Blades, Berlin	50¢@50¢5%

Heinisch's Snips.....40%

Jennings & Griffin Mfg. Co.'s, 6 1/2 to 10 in.....50%

Niagara Snips, Hatch, Pattern.....20%

P. S. & W. Forged Handles.....20%

Pruning Shears—

Cronk's Hand Shears.....33%

Cronk's Wood Handle Shears.....33%

Diaston's Combined Pruning Hook

and Saw, \$9 doz. \$18.00.....25%

Diaston's Pruning Hook, \$9 doz.

\$12.00.....25%

John T. Henry Mfg. Co.:

Pruning Shears, all grades.....50¢@10%

P. S. & W. Co.....33%

Wilkinson's Hedge, Wilcut Brand.....33%

Wilkinson's Lawn and Border, Wil-

cut Brand.....60¢@10%

Sheaves—Sliding Door—

Stowell's Anti-Friction.....50%

Patent Roller, Hatfield's, Sargent's

list.....70¢@10%

Reading.....40%

R. & E. list.....33%

Wright's Slide Hatch, Pattern.....30%

Sliding Shutter—

Reading list.....40%

R. & E. list.....33%

Sargent's list.....10¢@10%

Shells—Shells, Empty—

Brass Shells, Empty:

Climax, Club, Rival, 10 and 12

gauge.....65¢@5%

Paper Shells, Empty:

Acme, Ideal, Leader, New Rapid,

Magic, 10, 12, 16 and 20 gauge, 25¢@5%

Blue Rival, New Climax, Challenge,

Monarch, Defiance, Repeater, Yel-

low Rival, 10, 12, 16 and 20

gauge.....20%

Climax, Union, League, New Rival,

10 and 12 gauge.....25%

Climax, Union, League, New Rival,

11, 16 and 20 gauge.....20%

Expert, Metal Lined and Pigeon, 10

12, 16 and 20 gauge.....33%

Robin Hood, Low Brass.....20¢@5%

Robin Hood, High Brass.....30¢@5%

Shells, Loaded—

Loaded with Black Powder.....40%

Loaded with Smokeless Powder

medium grade.....40¢@5%

Loaded with Smokeless Powder

For the Table of "Current Metal Prices" see the First Issue of Every Month.